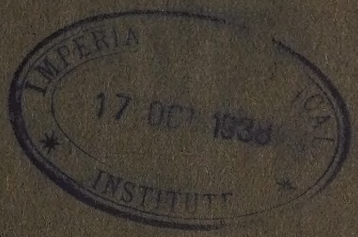
*THE*

*AGRICULTURAL ADVISORY DEPARTMENT*

*IMPERIAL COLLEGE OF TROPICAL AGRICULTURE.*




# REPORT

ON THE

# Agricultural Department

# ANTIGUA

# 1937.

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ISSUED BY

THE COMMISSIONER OF AGRICULTURE.

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1938

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## LETTER OF TRANSMITTAL.

CCS/JF.

17th June, 1938.

C.A. 769/38.

Sir,

I have the honour to transmit the annual report of the Agricultural Department of Antigua for the year 1937. The report is submitted in two parts. Part I. records the work of that branch of the Department under the direction of the Agricultural Superintendent, Mr. F. H. S. Warneford. the main function of which is the execution of a scheme of sugar cane experiments. Part II. records the work of that branch of the Department under the direction of the Peasant Agricultural Development Officer, Mr. C. A. Gomez, the main function of which is the development of peasant agriculture and the organization of the marketing of crops grown by small producers.

2. The total value of the chief products of agriculture and livestock exported during 1937 amounted to £334,874 compared with £199,443 in 1936 and an average of £182,416 for the three years 1934-36.

3. This remarkably large increase in the value of exports is almost entirely due to the increase in exports of sugar and its by-products, the value of which amounted to 97.4% of the total value of the exports under consideration. The relative value of sugar products exported has however not exceeded the average figure for the previous three years.

4. The sugar crop reaped and manufactured in 1937 amounted to 32,872 tons of sugar. This constitutes a record for Antigua. The average yield of cane per acre was 25.1 tons compared with 16.3 tons in 1936, 15.0 tons in 1935, 15.2 tons in 1934 and 20.1 tons in 1933.

5. The factors which contributed to the production of this record crop were an adequate and well distributed rainfall following upon the institution of improved manurial and cultural practices and the more suitable allocation of cane varieties to soil type.

6. Each year more and more knowledge is being accumulated for the benefit of local sugar cane producers from the results of the experimental scheme conducted in co-operation with the Sugar Cane Investigation Committee under the direction of Mr. P. E. Turner, Adviser in Sugar Cane Experiments to the Commissioner of Agriculture. The scheme aims at determining the most suitable cane variety, cultural and manurial treatments for each soil type under varying amounts of rainfall. Considerable progress has already been made and it is reasonable to assume that with the practical application of the knowledge gained the average annual production of sugar will be maintained at a higher level in future and that in any season of favourable weather conditions large crops will be produced.

7. Greater interest was taken in the cultivation of Sea Island cotton and an area of 950 acres was planted in the season of 1936-37, compared with 612 acres in 1935-36 and 200 acres in 1934-35. But the persistent rainy conditions which favoured the sugar cane crop proved to be very unfavourable for cotton. Consequently yield per acre amounted only to 96 lb of lint compared with 185 lb of lint in 1935-36. It is noteworthy that the growth of the cotton industry has resulted in the establishment of another ginnery in St. John's.

8. Satisfactory progress has been made in the Greencastle Experiment Station and in the land settlement areas at Greencastle, Matthews and Jonas's. Full details are given in the report. The total production of cane and its cash value to the allottees has greatly increased in the last two years.

9. In August, 1937, with the aid of financial assistance from the Colonial Development Fund in the form of a grant of £12,085, a five-year plan of peasant agricultural development was initiated. The execution of this plan forms the main function of the Peasant Agricultural Development section of the Department.

10. The main objects of this scheme are the organization of peasant sugar cane production, transport and sale to the factory in those districts where railway extensions are being made; the development and supervision of peasant settlement in certain old and incompleted land settlement schemes;

the encouragement of the production of and the organization of the marketing of Sea Island cotton in various peasant settlements in Antigua and in Barbuda; the encouragement of the cultivation of fruit and vegetables for export; and the improvement of livestock of the peasants. Moreover the plan provides for the establishment of a Government Marketing Depot for receiving, packing and marketing fruit and vegetable produce for export.

11. Before the close of the year the development of the scheme was well under way. Sugar cane and vegetable nurseries had been laid down in selected areas and various high grade animals had been imported.

12. The main functions of the two branches of the agricultural department, to which reference has been made in the preceding paragraphs, are respectively the improvement of the efficiency of sugar cane production and the introduction of a better standard of agriculture among peasant cultivators. There remains however an important duty for the agricultural department to fulfil, namely, the demonstration of the most suitable methods of effecting soil conservation. It is hoped that the necessary provision will be made in the near future for the department to undertake this urgent and important duty.

13. In conclusion reference must be made to the inauguration during the year of a Board of Agriculture for the Presidency. The advice and support to the work of the department which such a Board can give will undoubtedly prove of the greatest value.

I have the honour to be,

Sir,

Your obedient servant,

C. C. SKEETE,
Acting Commissioner of Agriculture.

His Honour,
The Administrator,
Antigua, B.W.I.

# REPORT ON THE AGRICULTURAL DEPARTMENT, ANTIGUA, FOR THE YEAR 1937.

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# Report on the Agricultural Department, Antigua

## For the Period January to December 1937

## PART I.

### SECTION 1. GENERAL AGRICULTURE.

**Weather Conditions.**

The average rainfall for 1937 amounted to 47.28 inches which is 3.61 inches above the average rainfall based on the past 64 years. The distribution, however, was unsatisfactory—a drought in May and June following on unusually heavy rainfall in January and February.

The prospects for the 1938 sugar crop, however, were good at the end of 1937, the estimate being about 25,000 tons.

Conditions at the end of 1937 were more favourable for cotton than had been the case the year before, and it was anticipated that yields per acre would be higher.

**Chief Crops.**

(*A*) *Sugar.* The average rainfall during 1936 was 59.99 inches, and unusually heavy rains fell in January and February 1937. As a result of these factors, together with improved manurial and cultural practices and the more suitable allocation of varieties to soil type, the 1937 crop was a record one, amounting to 32,501 tons crystals and 371 tons muscovado. The average yield of cane per acre was 25.1 tons compared with 16.3 tons in 1936, 15 tons in 1935, 15.2 tons in 1934 and 20.1 tons in 1933.

The price of sugar was rather better than was the case in 1936 and the average price received for the 31,113 tons grey crystals exported was £10. 2. 6.

The Moth Borer (Diatraea saccharalis) has continued to be the major pest of sugar cane, and Mr. H. E. Box has continued his investigations combining a Lixophaga breeding campaign with the introduction and extension of a new parasite—Paratheresia claripalpis.

The White Grub (Lachnosterna antiguae) has continued to cause damage in many fields, especially to recently germinated canes. It has been generally recognised that inadequate drainage is one of the factors favouring the prevalence of this pest, but it is also frequently encountered in fields with a marl subsoil where drainage conditions appear to be satisfactory.

The practice, on certain fields of the latter type, of smothering the old stools instead of ripping them out prior to recultivation is likely to account to some extent for the prevalence of grubs.

As was recorded in the last report, damage from root disease has not been so pronounced in most fields since greater care has been taken in the allocation of varieties.

Gumming disease has continued on the variety Ba.11569, but this variety, although showing pronounced leaf symptoms, possesses considerable powers of resistance to systemic infection and is at present the nearest approach to a general purposes cane for Antigua conditions. It is possible that it may ultimately be replaced by B.3127 one of the new Barbados varieties received in 1936 and planted in varietal experiments for the 1937-39 season.

One of the railway extensions the construction of which is financed by a loan granted from the Colonial Development Fund was completed in time for use in the 1937 crop and work was started on two other lines.

A noteworthy feature of the 1937 crop was the large proportion of peasants' cane milled. The Antigua Sugar Factory purchased over 40,000 tons of peasants' cane and the smaller Bendals Factory over 24,000 tons.

(*B*) *Cotton.* The 1937 crop was reaped from 950 acres, but the heavy rains in December 1936 and in January and February 1937 caused much damage and loss, and the total production amounted only to 96,940 lb. lint (91,111 lb. clean lint and 5,829 lb. stains) compared with 117,778 lb. in 1936. Prices obtained were from 1/9 to 1/11 per lb. for clean lint and 8¼d. to 1/- per lb. for stains.

During 1937 a new ginnery owned by Mr. M. S. Osborne of Montserrat was opened both for ginning and for the purchase of cotton. During this year also cotton was again grown in Barbuda after a period of six years without this crop.

The area planted for the 1937-38 crop was about 1,600 acres including 300 acres in Barbuda. Severe damage was done by the cotton caterpillar in many districts, but on the whole the prospects at the end of December were more favourable than at the end of December 1936.

**Board of Agriculture and Forestry.**

A Board of Agriculture and Forestry under the Chairmanship of His Honour the Administrator was constituted during 1937.

**Antigua Cotton Growers' Association.**

Peasants' cotton was again purchased at the Antigua Cotton Factory on behalf of the Association, 33,439 lbs. being bought at 4½d. per lb. followed by a further payment on resale of the cotton at the rate of 1d. per lb., this being a Bonus equivalent to rather more than 75% of the profits.

The Second Ordinary General Meeting of the West Indian Sea Island Cotton Association (Inc.) was held in Antigua in November. Mr. E. D. Dew represented Antigua.

**Development of Peasant Agriculture.**

The work of the Peasant Agricultural Development Department established in 1936 to further peasant agricultural industries with special reference to cotton and to vegetables was expanded to cover the peasants' sugar crop (other than the Land Settlements of Greencastle, Matthews, Jonas and The Folly) and stock. A separate report on the activities of this Department is published under the same cover as this report.

**Agricultural Exports.**

The following Table shows the chief agricultural products exported during the years 1934, 1935, 1936 and 1937:

AGRICULTURAL EXPORTS, 1934—1937.

| Article. | 1934. | | 1935. | | 1936. | | 1937. | |
|---|---|---|---|---|---|---|---|---|
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| | | £ | | £ | | £ | | £ |
| Sugar (Crystals) .. | 19,505 tons | 182,096 | 16,072 tons | 151,249 | 19,759 tons | 180,240 | 31,113 tons | 315,577 |
| „ (Muscovado) .. | .. | .. | 100 tons | 800 | 100 „ | 1,053 | 314 „ | 3,026 |
| Molasses (V. Pan) .. | 808,459 gals. | 2,515 | 324,562 gals. | 2,183 | 536,177 gals. | 3,351 | 593,938 gals. | 3,712 |
| „ (Muscovado) .. | 32,715 „ | 1,968 | 33,802 „ | 1,690 | 44,955 „ | 1,980 | 49,976 „ | 2,820 |
| Rum .. .. .. | 851 „ | 133 | 2,008 „ | 293 | 6,425 „ | 935 | 6,831 „ | 1,080 |
| Cotton Lint .. .. | 9,600 lb. | 480 | 32,950 lb. | 2,062 | 117,380 lbs. | 8,988 | 96,940 lbs. | 7,131 |
| Lime Juice (raw) .. | 3,712 gals. | 142 | 6,916 gals. | 305 | 6,106 gals. | 154 | 1,170 gals. | 33 |
| Green Limes .. .. | 97 brls. | 85 | 77 brls. | 57 | 94 crts. | 13 | 577 crts. | 106 |
| Lime Oil .. .. | 40 gals. | 395 | 56 gals. | 448 | 248 gals. | 1,762 | 36 gals. | 181 |
| Tamarinds .. .. | 152 brls. | 93 | 461 brls. | 295 | 522 brls. | 522 | 497 brls. | 506 |
| Tomatoes .. .. | .. | .. | .. | .. | 147 crts. | 30 | 1,988 crts. | 292 |
| Hides and Skins .. .. | .. | 75 | | 204 | | 232 | | 246 |
| Coconuts .. .. | 400 | 2 | 2,300 | 9 | 20,399 | 72 | 34,607 | 99 |
| Onions .. .. .. | 10 crts. | 6 | .. | .. | 75 crts. | 25 | 1,610 lbs. | 14 |
| Horses .. .. .. | 2 | 25 | 8 | 96 | 6 | 80 | 3 | 42 |
| Asses .. .. .. | 6 | 7 | 16 | 64 | 1 | 6 | 5 | 9 |
| Mules .. .. .. | 1 | 12 | 1 | 10 | .. | .. | .. | .. |

## SECTION II. WORK OF THE DEPARTMENT OF AGRICULTURE

### PLANT IMPORTATIONS.

During the year the following plants and seeds were imported:—

#### Plants or Cuttings.

Cane Cuttings.

| | | |
|---|---|---|
| B.34163 .. | 4 | cuttings from Plant Quarantine Station, Trinidad. |
| B.34104 .. | 4 | „ „ „ „ „ „ |
| B.34117 .. | 4 | „ „ „ „ „ „ |

B.34163 and B.34104 are both crosses between Co. 281 and B.H. 10.12. B.34117 is a cross between P.O.J. 2725 and Co.281. These varieties were received for rapid extension for trial on some of the more infertile clay soils for which the most suitable of the varieties already under cultivation are P.O.J. 2878 and Co. 213.

#### SEEDS.

| | |
|---|---|
| Cotton Seed .. .. .. | 5,000 lbs. from Montserrat. |
| Onion Seed .. .. .. | 68 „ „ Teneriffe. |
| Cauliflower Seed (Early Patna) .. | 16 oz. from India through the Commissioner of Agriculture. |
| Other Vegetable Seeds .. .. | 21 lbs. from U.S.A. |
| Flower Seeds .. .. .. | 6 oz. from U.S.A. |

### PLANT AND SEED DISTRIBUTION.

The following plants and seeds were distributed during the period under review:

| | | |
|---|---|---|
| Cane Cuttings .. .. .. .. | *51,212 | |
| *B.726 .. .. .. .. | 19,800 | |
| B.H.10.12 .. .. .. | 13,000 | |
| Co.290 .. .. .. .. | 6,500 | |
| B.3439 .. .. .. .. | 3,200 | |
| B.3127 .. .. .. .. | 2,400 | |
| B.3124 .. .. .. .. | 1,600 | |
| B.3013 .. .. .. .. | 1,612 | |
| M.28 .. .. .. .. | 1,100 | |
| | 51,212 | |
| Tomato Seedlings .. .. .. | 28,760 | |
| Onion Seedlings .. .. .. | 25,000 | |
| Budded Oranges .. .. .. | 56 | |
| „ Limes .. .. .. | 7 | |
| „ Tangerines .. .. .. | 13 | |
| „ Mandarines .. .. .. | 8 | |
| „ Grape Fruit .. .. .. | 9 | |
| „ Mango .. .. .. | 57 | |
| „ Avocado Pear .. .. .. | 24 | |
| Bread Fruit .. .. .. .. | 69 | |
| „ Nut .. .. .. .. | 18 | |
| Mahogany .. .. .. .. | 108 | |
| Whitewood .. .. .. .. | 36 | |
| Cassia .. .. .. .. | 148 | |
| Casuarina .. .. .. .. | 70 | |
| Gliricidia .. .. .. .. | 60 | |
| Miscellaneous Forest Trees .. .. | 16 | |
| Miscellaneous Fruit Trees .. .. | 4 | |
| Miscellaneous Ornamental Plants .. | 58 | |
| Onion Seed .. .. .. .. | 65 | lbs. |
| Cauliflower Seed .. .. .. | 10 | ozs. |
| Other Vegetable Seeds .. .. .. | 23 | lbs. |
| Flower Seeds .. .. .. .. | 7 | ozs. |

### WORK AT GREENCASTLE EXPERIMENT STATION.

#### NURSERY WORK.

A. *Sugar Cane.*

The following varieties were grown as plant canes:—B.H. 10.12, Ba.11569, B. 374, B. 726, B.891, B. 2935, B. 3013, B. 3124, B.3127, B.3439, G. 119,

P.O.J. 2878, M.28, M.42, F.C. 916 and Co. 290, together with specimen plots of B.3922, B.147 (4507), B.6308, B.417, M.3, M.7, F.C.988, S.C.12.4, Co.213, Co. 221, Co.281, P.O.J. 36, P.O.J. 213, P.O.J. 234, P.O.J. 2714, P.O.J. 2725, and P.O.J. 2727.

B.H.10.12, Ba. 11569, B. 374, B.726, B. 891,, B. 2935, P.O.J. 2878, G. 119, F.C. 916, F.C. 988, M. 3, M. 7, and M. 42 were cultivated as first ratoons together with the small plots planted under the varieties received from the Plant Quarantine Station in March, 1936, and listed in the Annual Report for that year.

Of the four new varieties which were extended during 1937, viz. B.3013, B. 3124, B. 3127 and B. 3439, the first and the last appear to be most suited to conditions at the Experiment Station. B. 3127 is reputed to have good ratooning powers under difficult conditions and a good quality juice. It is hoped that it will prove a competitor with Ba. 11569. It has the advantage over the latter cane of being resistant to gumming disease.

*New Varieties.*

Four cuttings of each of the following canes were received in June from the Plant Quarantine Station in Trinidad: B. 34104, B. 34117 and B. 34163. These were extended by stool dissection in November, plots of 65 stools of each variety being established which should provide sufficient planting material for one varietal trial in the 1938-40 season.

*B. Fruit and Vegetables.*

*Citrus Fruit.* No citrus fruit were raised during the year, a large number of those raised in 1936 still being on hand. 400 sour orange stocks were grown for budding during 1938.

*Mangoes.* Results with mangoes were not as satisfactory as had been the case in 1936. The following varieties were propagated:

| | |
|---|---|
| Julie .. .. .. .. | 50 |
| Ceylon .. .. .. .. | 26 |
| Gordon .. .. .. .. | 12 |
| Bombay .. .. .. .. | 4 |
| Total .. .. .. | 92 |

*Avocado Pears.* Twenty-one plants were propagated, all of the variety Pollock.

*Bread Fruit.*. Two hundred and fifty plants were raised from root cuttings.

*Bread Nut.* Twenty-three plants were propagated.

*Onions.* 25,000 seedlings were grown.

*Tomatoes.* 28,760 tomato seedlings were raised and distributed on behalf of the Peasant Agricultural Development Department.

*Eddoes, Yams and Sweet Potatoes.* Nursery plots were grown of the following varieties:

*Eddoes.* Tannia Eddoe, Tannia yellow, Tannia white, Tannia Roliza, Tannia Priete and Tannia Roliza white.

*Yams.* Seal Top, Bugle Horn, Cush Cush, Light Red, Lisbon and Crop.

*Sweet Potatoes.* V 52, White Gilkes and Three Months, the last being a quick growing variety obtained through the courtesy of the Peasant Agricultural Development Officer.

## FRUIT PLOTS.

*Citrus.* All citrus plots made good growth during the year. In February the trees received 1 lb Sulphate of Potash and four buckets of vegetable compost and were then mulched with cane trash and other decaying organic matter.

A fair crop was reaped from the older trees during 1937, the value of the fruit sold being over £10.

The Washington Navel Oranges were of excellent quality, with the exception of those from two trees. These trees which bore seedless fruit with typical navels but with a very acid juice have been cut back for top working.

The Valencias fruited heavily, but unfortunately the fruit were somewhat too acid to command the best prices.

A plot of the following varieties planted in 1936 made rapid growth during 1937 and commenced to fruit at the end of the year: Sanford Mediterranean, Ruby, St. Michael, Parson Brown, Lue Gin Gong and Lambs Summer.

Further improvement was observed with the small plot of Marsh's Seedless Grapefruit, and a fair crop was set by the end of the year.

*Mangoes.* The mango trees made good growth during 1937, but the crop was a very poor one owing to failure of the trees to set fruit during the wet weather in January, February and April, 1937.

*Orchard.* The orchard which was started at the end of 1934 made good progress during the year. The following fruit trees have now been established:

| | | |
|---|---|---|
| Mangoes—Julie | .. .. .. | 80 trees |
| Ceylon | .. .. .. | 10 ,, |
| Gordon | .. .. | 5 ,, |
| Bombay | .. .. .. | 18 ,, |
| Peter | .. .. .. | 2 ,, |
| Unknown variety of good quality | | 8 ,, |
| Avocado Pears—Pollock | .. .. | 13 ,, |
| St. Anne | .. .. | 10 ,, |
| Citrus—Washington Navel Orange | .. | 13 ,, |
| Valencia ,, | .. | 6 ,, |
| Archbishop ,, | .. | 3 ,, |
| Lue Gin Gong ,, | .. | 6 ,, |
| St. Michael ,, | .. | 5 ,, |
| Tangerine | .. .. .. | 6 ,, |
| Marsh's Seedless Grape Fruit | .. | 5 ,, |

The pears and mangoes, especially the Ceylon, made rapid growth, but some of the citrus situated opposite spots where the wind break is thin, suffered badly from scale and die back. The wind break is being reinforced at these points, and it is hoped that the citrus will improve as soon as the shelter is adequate.

## II. EXPERIMENTAL WORK.

For convenience the experiments conducted with sugar cane at the Experiment Station are included in the section on sugar cane experiments which deals with field experiments conducted by the Department in various parts of the island.

## MODEL ALLOTMENT.

The report on the Model Allotment covers the period October 1st, 1936, to September 30th, 1937. The statement of annual expenditure and revenue for the various plot units is not included in this report but may be consulted at the office of the Agricultural Department. The statement of revenue and expenditure in connection with the individual crops is shown in Table A.

The total expenditure during the period under review amounted to £36. 16. 10. and the total revenue to £65. 14. 6., there being a profit of £28. 17. 8

The total expenditure since the laying down of the plots amounted to £294. 10. 0½. and the total revenue to £334. 13. 8., leaving a profit to date of £40. 3. 7½.

If the fruit plot which up to date shows a deficit of £19. 15. 11. be considered apart from the remainder of the allotment, the latter now shows a credit balance of £59. 19. 6½.

The mango crop, as a result of heavy rains and damp weather at the time of blossoming, was very poor. The fruit plot will begin to pay as soon as fair crops of this fruit are reaped.

Sugar cane and sweet potatoes have proved profitable crops and a small profit has been made with carrots on the vegetable plot. Losses have been experienced with cassava yams, eddoes, beet and cauliflower.

On the whole the conclusions reached in previous seasons have been confirmed, and as a result of six years working, it can now be confidently stated that sugar cane and sweet potatoes are the most profitable crops for the locality, although profits may at times be made with vegetables, yams and cassava. Eddoes generally fail on the heavy soil which is unsuitable for this crop. The area under vegetables, eddoes, cassava and yams has accordingly been reduced and the area under sweet potatoes increased correspondingly.

As has been stated in previous reports, consideration has been given to the question of making allowance on the one hand for the cost of supervision and of the instalments of the purchase price of the allotment and on the other hand for the fact that the revenue should be credited with a sum equivalent to two days work a week by the holder (1/6 per diem) and with sundry small sums paid for marketing, reaping of vegetables, etc., which would in many cases be done free of cost by members of the allottee's family. As both these figures are estimated at about £8 per annum, they may be disregarded and the statement of revenue and expenditure as presented may be accepted as correct.

## TABLE A.

### Model Allotment.

TABLE OF CROP EXPENDITURE AND REVENUE.

| Crop. | Plot. | Expenditure. | | | Revenue. | | | Profit. | | | Loss. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | £ | s. | d. | £ | s. | d. | £ | s. | d. | £ | s. | d. |
| Plant Canes .. | 1–5 | 15 | 3 | 5 | 23 | 19 | 10 | 8 | 16 | 5 | .. | | |
| First Ratoons .. | 23–27 | 3 | 15 | 3 | 16 | 3 | 7 | 12 | 8 | 4 | .. | | |
| Second Ratoons .. | 18–22 | 3 | 11 | 1 | 13 | 3 | 0 | 9 | 11 | 11 | .. | | |
| Sweet Potatoes .. | 15–17 | 2 | 18 | 5 | 4 | 17 | 2 | 1 | 18 | 9 | .. | | |
| Cassava .. | 13 | 1 | 17 | 9 | | 14 | 0 | .. | | | 1 | 3 | 9 |
| Yams .. .. | 14 | 1 | 10 | 6 | | 11 | 1 | .. | | | | 19 | 5 |
| Eddoes .. .. | 14 | | 18 | 6 | | 6 | 6 | .. | | | | 12 | 0 |
| Vegetables .. .. | 11–12 | 6 | 6 | 8 | 5 | 6 | 11 | .. | | | | 19 | 9 |

ANALYSIS OF REVENUE AND EXPENDITURE—VEGETABLES.

| | Cauliflower. | | | Carrots. | | | Beet. | | | Tomatoes. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | s. | d. | £ | s. | d. | £ | s. | d. | £ | s. | d. |
| General preparation and care .. | 0 | 6 | 1 | 0 | 2 | 2 | 0 | 2 | 8 | 1 | 10 | 11 |
| Manure and application .. | | 3 | 6 | | 1 | 4 | | 1 | 7 | | 17 | 8 |
| Watering .. .. | | 4 | 0 | | | 6 | | 1 | 0 | | 1 | 0 |
| Seeds, Seedlings and planting . | 1 | 5 | 0 | | 5 | 5 | | 3 | 4 | | 1 | 0 |
| Insect control .. .. | | 5 | 0 | | | | | 5 | 0 | | 7 | 6 |
| Reaping and Transport .. | | | | | | | | | | | 2 | 0 |
| Total .. . | 2 | 3 | 7 | | 9 | 5 | | 13 | 7 | 3 | 0 | 1 |
| Revenue .. .. | 1 | 10 | 4 | 1 | 16 | 8 | | 13 | 5 | 1 | 6 | 6 |
| Profit .. .. | | | | 1 | 7 | 3 | | | | | | |
| Loss .. .. | | 13 | 3 | | | | | | 2 | 1 | 13 | 7 |

## WORK IN CONNECTION WITH THE SUGAR CANE CROP.

### Field Statistics.

A questionnaire was sent by the Agricultural Department to each estate in the island with a view to obtaining definite information as to the acreages under the different varieties, the manurial treatment of the fields and the methods of cultivation.

Information was received with respect to 2,276.25 acres planted for the 1938 crop. This is rather less than the acreage included in the 1937 report but the total acreage planted for 1938 was only 2,881 acres as compared with 3,604 acres for 1937, so that the percentage reported (78%) may be regarded as satisfactory.

As regards varieties the following Tables show:

(1) The actual acreages and percentage acreages under the different varieties reported with respect to the 1938 crop.

(2) The relative areas planted under the more widely grown varieties for the seasons, 1934, 1935, 1936 and 1937.

**1938 Crop.**

Plant Canes for 1938. Acreages under different varieties.

| Variety. | Acres. | % Reported Acreage. |
|---|---|---|
| Ba.11569 .. .. .. | 823.5 | 36.2 |
| B.H.10.12 .. .. .. | 471.25 | 20.7 |
| B. 2935 .. .. .. | 314.0 | 13.8 |
| B. 4507 (B.147) .. .. | 304.5 | 13.3 |
| Mixed .. .. .. | 150.5 | 6.6 |
| P.O.J. 2878 .. .. .. | 93.75 | 4.1 |
| B. 726 .. .. .. | 57.5 | 2.5 |
| Co. 213 .. .. .. | 28.75 | 1.3 |
| B. 4596 .. .. .. | 16.00 | .7 |
| B. 6308 .. .. .. | 6.0 | .3 |
| G. 119 .. .. .. | 5,0 | .3 |
| B. 606 .. .. .. | 3.5 | .1 |
| S.C. 12.4 .. .. .. | 1.0 | .05 |
| Co. 290 .. .. .. | 1.0 | .05 |
| | 2,276.25 | 100.00 |

Relative Areas under chief varieties 1934-1938.

| Year | Ba.11569 | B.H.10.12 | B.2935 | B.147 (B.4507) | P.O.J. 2878 | B.726 |
|---|---|---|---|---|---|---|
| 1934 .. | 14.0% | 37.2% | —% | 26.0% | 9.3% | —% |
| 1935 .. | 21.5% | 43.6% | —% | 9.9% | 10.4% | 0.9% |
| 1936 .. | 23.0% | 35.7% | 0.8% | 8.6% | 20.2% | 1.3% |
| 1937 .. | 33.0% | 24.6% | 9.1% | 11.9% | 6.5% | 3.1% |
| 1938 .. | 36.2% | 20.7% | 13.8% | 13.3% | 4.1% | 2.5% |

The increase in the area under Ba.11569 and the decreases in the area under B.H.10.12 and P.O.J.2878 have continued. There has been a further increase in the area under B.147 (B.4507).

The field characteristics of the varieties are discussed at some length in the section on varietal experiments and recommendations as to varieties were issued in the form of a varietal planting programme at the end of 1937. It will suffice here to state that Ba.11569 is the nearest approach to a general purposes variety for Antigua conditions and that the area under this cane could probably be increased with profit. B.2935 could also be further extended on the lighter calcareous fields where it will probably outyield all other varieties.

The increase in the area under B.147 (B.4507) has doubtless resulted from the improvement in germination observed after lime water treatment. It appears however to be definitely inferior to Ba.11569 and B.2935 even on the soils to which it is best suited, and the area should be reduced.

The following Tables show respectively the method of cultivation of the fields prepared for the 1937 crop and the 1938 crop and the manurial treatment.

METHOD OF CULTIVATION.

| | Gyrotiller | | Tractor | | Cattle | |
|---|---|---|---|---|---|---|
| | Flat | Banked | Flat | Banked | Plough | Total |
| For 1937 acres | 543.25 | 262.0 | 282.25 | 90.0 | 1793.5 | 2971 |
| % of area reported | 18.3 | 8.8 | 9.5 | 3.0 | 60.4 | 100.00 |
| For 1938 acres | 228.25 | 105.5 | 244.0 | 49.5 | 1649.0 | 2276.25 |
| % of area reported | 10.0 | 4.6 | 10.7 | 2.2 | 72.5 | 100.00 |

The most noteworthy change is the reduction in the area cultivated with the gyrotiller. This was due to the abnormally wet weather during 1936 which prevented its use for many months.

MANURIAL TREATMENT.

| | Pen manure. | Pen manure & N. P. | Filter Press Mud. | Filter Press Mud and Inorganics. | Sheep Manure. | Inorganics only. | Ashes | Ne Manure. | Total. |
|---|---|---|---|---|---|---|---|---|---|
| For 1937–acres | 2,140·8 | ... | 266·5 | ... | 111·25 | 48·0 | .. | 399·25 | 2,971 |
| %of area reported | 72·1 | ... | 9·0 | ... | 3·8 | 1·6 | ... | 13 5 | 100·00 |
| For 1938–acres | 1,038·75 | 364·0 | 104·25 | 73·5 | 110·25 | 234·75 | 9·0 | 341·75 | 2,276·25 |
| %of area reported | 45·7 | 16·0 | 4·6 | 3·2 | 4·8 | 10·3 | 0·4 | 15·0 | 100·00 |
| | 61·7 | | 7·8 | | | | | | |

It will be observed that there has been a marked increase in the area receiving inorganic manures. In 1937 only 1.6% of the area planted received inorganics while for 1938 29.5% of the total area received inorganic fertilizers, either alone or together with pen manure or filter press mud.

The area receiving no manure at all is still high, viz. 15.0% of the total area planted. Both experimental results and field observations indicate that this is an uneconomic practice.

The following figures with respect to imports of inorganic fertilizers indicate the considerable increase in their use in recent years since the inception of the Sugar Cane Experiment Scheme:

| Year. | Value of Imports. |
|---|---|
| 1934 .. .. .. .. | £2,388 |
| 1935 .. .. .. .. | 2,069 |
| 1936 .. .. .. .. | 2,748 |
| 1937 .. .. .. .. | 3,962 |

The quantities of the different fertilizers imported are not available earlier than 1936. The following Table gives the imports for that year and for 1937:

| | 1936 | 1937 |
|---|---|---|
| Sulphate of Ammonia .. .. | 317 tons | 376 tons |
| Superphosphate .. .. | 122 „ | 137 „ |
| Potash (Sulphate or Muriate) .. | 10.5 „ | 5 „ |
| Niciphos .. .. .. | 25.0 „ | 75.5 „ |
| Complete Inorganic .. .. | | 5.0 „ |
| Total | 474.5 „ | 598.5 „ |

## SUGAR CANE EXPERIMENTS.

The experiments reported in this Section form portion of a comprehensive series of experiments conducted by this Department and by Mr. C. F. Charter, Agronomist to the Gunthorpes Estates under the auspices of the Antigua Sugar Cane Investigation Committee and under the direction of Mr. P. E. Turner, Adviser in Sugar Cane Experiments to the Commissioner of Agriculture.

A complete report on these experiments will be published in due course. Only those under the supervision of the Agricultural Department are here recorded.

The thanks of the Agricultural Superintendent are due to Mr. Turner for certain soil analyses, for statistical analysis of the results and for general advice and assistance in the preparation of this report.

Details as to sites and lay out of experiments and yield data are given in Appendix I attached to this report. Only a summary and discussion of results is included in this section.

## VARIETAL EXPERIMENTS.

B.2935 has done well as a Plant Cane in every experiment reaped in 1937, filling the first place at Gaynors, High Point, Yeamans and the better drained square at Jolly Hill. As a ratoon this variety has done well on the comparatively light calcareous soil at Collins and has failed on the heavy soils at Jolly Hill and at Parham New Work.

Ba.11569 has done well both as a Plant Cane and as a Ratoon. Unfortunately it was not included in the varieties cultivated as first ratoons at Jolly Hill and at Parham New Work.

P.O.J. 2878 has done well as a plant cane at Jolly Hill and as a ratoon on the heavy poorly drained soils at Sandersons, Jolly Hill and Parham New Work during a year of exceptionally high rainfall.

B.147 has given comparatively poor results as a plant cane even when planted in October (B.147E at High Point). As a second ratoon at Collins it fills the fourth place, but is only 3 tons lower in yield than the leading variety. It is a complete failure at Jolly Hill and Parham New Work.

B.H.10.12 although beaten by B.2935 and Ba.11569 has done well as a plant cane at Gaynors, Yeamans and Jolly Hill during the wet season experienced. It has ratooned well at Collins and at Jolly Hill, but poorly at Sandersons and Parham New Work.

B.726 both as a plant cane and as a ratoon has been about equal to B.H.10.12.

B.891 has done reasonably well both at High Point and at Gaynors, but at neither station is equal to the best varieties. It failed badly as a ratoon at Parham New Work.

S.C. 12.4 has been included in all four of the ratoon experiments reaped in 1937. At each station it has been among the poorest varieties.

B.6308, an old variety, has ratooned well at Jolly Hill but only poorly at Sandersons.

The general position as regards the varieties may be summarised as follows:

Ba.11569 both as a plant cane and as a ratoon does well on most types of soil in Antigua, and of the established varieties, is the nearest approach to a general purposes cane. It has not been cultivated to any extent on the alluvial soils. It is a quick growing variety and stands drought well. Its juice qualities are moderately good. At times its germination is indifferent. Soaking in Lime water for 48 hours, together with the use of young material* taken from well manured canes is helpful in this respect.

B.2935 does well as a plant cane on all soil types, but as a ratoon is intolerant of poor drainage and is likely to fail on heavy soils. On the lighter calcareous soils it ratoons well and will probably beat any other of the standard varieties over a series of crops (Plant cane, 1st and 2nd ratoons). Its juice qualities are only moderately good. It is usually a ready germinator.

B.147 (B.4507) has long had a reputation as a good cane for the lighre-calcareous soils. It ratoons well and is drought resistant. It is intolerant of poorly drained soils, and must be established early. The germination of this variety is excellent if the cuttings are soaked for 48 hours in saturated lime water, otherwise germination may be indifferent unless soil moisture conditions are especially favourable. Its juice qualities are moderately good. In the experiments recorded above it has been beaten by B.2935 and Ba.11569 even on the type of soil to which it is best suited and even when planted early (High Point 1937).

B.H.10.12 does well on alluvial soils, Fitches clays, calcareous, Gunthorpes clays and the more fertile Ottos clay soils—under conditions of fair rainfall. It is intolerant of poor drainage and dry situations. For the latter reason it is not generally suited to the calcareous soils of the East and Northeast districts, but has done well in this region as a plant cane at Gaynors and as a 2nd ratoon at Collins in 1937, a year of exceptional rainfall. B.H.10.12 is a cane of excellent juice qualities. It is a ready germinator.

B.726 is a possible competitor of B.H.10.12 on the soil types best suited to the latter. It is well suited to the alluvial soils of the Bendals and Jolly Hill areas. Like B.H.10.12 it is a cane of excellent juice qualities and is a ready germinator.

P.O.J.2878 is well suited to the alluvial soils, especially in the Jolly Hill area where it has proved the best yielding cane both as a plant cane and as a ratoon in the experiments conducted during the past four years. This variety has done well in other parts of Antigua in years of exceptionally high and well distributed rainfall, but even under these conditions it has generally been beaten by B.2935 or Ba.11569. In normal years it is suited only to the wetter districts or to soils whose topographical situation renders them wet soils. It is a very easy cane to establish and makes rapid early growth. It is tolerant of poor drainage but requires a plentiful supply of moisture throughout the growing period to give good yields. The percentage sucrose in the juice is fairly high but the juice possesses certain undesirable qualities which make this cane poor from the factory point of view.

The above (together with Co.213, which is grown on certain shallow soils, on hillsides, in the North and Northeast districts and on Tomlinson clays in the Paynters area) may be regarded as the standard varieties now in general cultivation.

The following comments are made on the other varieties which have been included in these experiments.

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* C. F. Charter—private communications.

B.891 does well on the calcareous soils, but is beaten by B.2935 and Ba.11569. It is a cane with excellent juice qualities. It does not ratoon well on heavy soils. It is very badly attacked by moth borer (Diatraea saccharalis).

B.381 and B.374 were included in the experiment reaped at Jolly Hill as plant cane in 1933 and as 1st ratoon in 1934. These varieties were inferior to B.726, B.891 and B.H.10.12 in juice qualities and did not exceed the latter in tonnage of cane and were omitted from subsequent experiments.

G.119 has done well at times on fertile and well watered soils. It is a variety of poor juice qualities and is not recommended for extension.

G.140 and P.O.J.213 were included in the experiment at Fitches Creek reaped as plant canes in 1933 and 1st ratoons in 1934. Mediocre in performance both for field and juice qualities, they have been omitted from subsequent experiments.

S.C. 12.4 is not well suited to most Antigua soils.

B. 6308 once a popular variety has done well as a ratoon at Jolly Hill in 1937. It is however, as a rule, inferior both from field and factory points of view.

## MANURIAL AND CULTURAL EXPERIMENTS.

Significant and considerable gains in yield have followed the application of Pen Manure to Plant Canes both at Gaynors (1935) and at Pares and Cochranes (1936). Significant residual effects have been observed with the first ratoons at Pares and Cochranes and with first and second ratoons at Gaynors.

At Ottos, where a very small though statistically significant increase in yield of the plant cane crop resulted from the late application of Pen Manure, there was a larger significant residual effect on the first ratoons—the gain in yield being 3.8 tons per acre for 16 tons Pen Manure of rather poor quality.

At Thibous,* where late applications of Pen Manure failed to give increased yields with plant canes, the residual effect was significant and considerable—the increased yield being 6.09 tons per acre.

At Thibous also, late applications of filter press mud which failed to give increased yields with plant canes gave considerable and statistically significant increases with the first ratoons.

At Yeamans significant gains in yield from filter press mud and from Pen Manure were obtained with plant cane in 1935, and significant residual effects with ratoons in 1936 and 1937.

At Carlisle and at Parrys experiments were reaped which were devised to measure the residual effect of a complete inorganic manure applied late to plant canes, both in the presence and absence of Sulphate of Ammonia applied to the ratoons. In neither experiment had significant increases been obtained with the plant cane crop, but at Parrys there was a statistically significant though small residual effect on the first ratoons.

It appears that the residual effect of pen manure and of filter press mud even when applied too late to the plant cane crop to produce an immediate increase may be considerable, but that the residual effect of an organic fertilizer supplying nitrogen phosphate and potash applied late may be statistically non-significant or only small although statistically significant.

Significant residual effects of Sulphate of Ammonia applied to the preceding crop have been recorded at Greencastle, Cochranes and Thomas' and at Collins. At Greencastle Sulphate of Ammonia had been applied to the plant cane crop on an alluvial soil in the presence of a basal dressing of pen manure and produced no immediate gains. At Cochranes and Thomas' Sulphate of

* Applications of Pen Manure when made early are not invariably followed by economic gains in yield. In one experiment reaped in 1936, it was found that 20 tons good Pen Manure per acre gave only 1.35 tons per acre gain, and it is suggested that satisfactory immediate gains in yield from Pen Manure depend on the previous manurial treatment, fields regularly manured in the past possessing a sufficient store of available phosphate for the early needs of the crop and thus responding, while in the case of fields not regularly manured in the past the store of available nutrients is low and pen manure is unlikely to release the necessary phosphate in available form until it is too late. (Recent investigations on Sugar Cane and Sugar Cane Soils in Antigua—Turner, Warneford and Charter, Tropical Agriculture. Vol. XIV, No. 5.)

Ammonia had been applied to plant canes on a calcareous Gunthorpes clay and caused no immediate gain in yield. At Collins the residual gain in yield was from Sulphate of Ammonia applied to the first ratoon crop.

At Carlisle and Parrys Sulphate of Ammonia applied to first ratoons in the experiment already quoted resulted in significant gains, on calcareous soils, of 2.42 tons per acre and 4.22 tons per acre respectively. At Long Lane and at Ffryes statistically significant gains in yield of plant canes resulted from applications of pen manure alone and in the presence of various combinations of inorganic fertilizers. At both stations the gains from pen manure alone were smaller than those resulting from a complete inorganic fertilizer alone, but the greatest increases in yield were obtained from pen manure plus a complete inorganic fertilizer.

A series of experiments without pen manure has also been reaped in which complete inorganic fertilizers and various combinations of inorganic fertilizers have been applied to plant canes. The following Table summarises the results obtained in this series and in the absence of pen manure in the experiments at Ffryes and Long Lane already quoted.

| Site. | Soil Type. | Period between planting and application of early manures. | Yields and Gains. Tons per Acre. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | No manure. | N. only. | Gain. | Complete Inorganic. | Gain | Mean Gains from N. | Mean Gains from P. | Mean Gains from K |
| Sandersons ... | G. non-calc | 8½ wks | 25 2 | 27·9 | +2 7 | 35·6 | +10·4 | ÷3.7 | +5·0 | +1·4 |
| Ffryes ... | F.G. calc. | 8½ , | 48·1 | 50·6 | +2·5 | 55·8 | + 7·7 | +5 5 | +1·3 | +1·3 |
| Millars ... | F „ | 5½ , | 43·5 | 50·3 | +6·8 | 50 6 | + 7·1 | +5 5·6 | +0·81 | +0·09 |
| Long Lane ... | F „ | 7 „ | 37 1 | 40 5 | +3·5 | 43 6 | + 6·6 | +1·8 | +2·1 | +1·3 |
| Bodkins ... | G. calc. | 11 „ | 40·8 | 44 9 | +4 1 | 44 8 | + 4·0 | +4·1 | 0·0 | +0·3 |
| La Roches ... | O. non-calc. | 8½ „ | 38·9 | ... | ... | 42 9 | + 4·0 | ... | | ... |
| Diamond ... | F. calc | 7 „ | 43·0 | 43·7 | +0 7 | 46 9 | + 3·9 | + ·74 | +2 54 | +0·09 |
| Winthorpes ... | F. „ | 20 „ | 32 8 | 33 4 | +0·6 | 36·1 | + 3 3 | +0 6 | ... | ... |
| Langfords .. | F. „ | 13 „ | 39 8 | 40·4 | +0·6 | 42 1 | + 2·3 | +1·17 | +1·38 | +0·01 |
| Collins ... | F. „ | 7½ „ | 39·8 | 40·7 | +0 9 | 41·9 | + 2·1 | +1·4 | +0·3 | +1·6 |
| Blackmans ... | F. „ | 7½ „ | 33·3 | 32·7 | -0 6 | 34·1 | + 0·8 | -0 45 | +1·23 | +0·44 |
| Jolly Hill ... | A. | 8 „ | 48·4 | 49·5 | +1·1 | 49·0 | + 0·6 | +0·3 | -0·34 | +0·02 |

Soil Types :—F. Fitches Clay.
G Gunthorpes Clay.
O. Ottos Clay.
A. Alluvial.

Considerable gains in yield have resulted from applications of Sulphate of Ammonia alone to calcareous soils at Millars and at Bodkins, and at both sites the resulting gains have equalled those produced by complete inorganic fertilizers.

At Sandersons, Long Lane and Ffryes Sulphate of Ammonia alone has produced increases in yield but the increases from complete inorganics have been considerably greater, and due also to phosphate and to a lesser extent to potash.

Considerable increases in yield have resulted from applications of complete inorganic fertilizers at Winthorpes and at La Roches. At the first mentioned site Sulphate of Ammonia alone produced little increase and at La Roches no treatment with Sulphate of Ammonia alone was included in the experiment.

At the Diamond there was little gain from Sulphate of Ammonia alone, and the increase of 3.9 tons per acre from the complete inorganic was due mainly to phosphate.

Small but statistically significant gains in yield from nitrogen and phosphate occurred at Langfords and from phosphate at Blackmans.

Small but statistically significant gains in yield resulted from the application of Sulphate of Ammonia in the presence of potash at Collins.

The results of experiments reaped in previous years have indicated that as a rule satisfactory gains in yield may be obtained by the application of Sulphate of Ammonia alone to non calcareous or feebly calcareous soils in Antigua, but that on the calcareous soils an increase from nitrogen is only observed in the presence of an adequate supply of available phosphate which must be applied early in the life of the plant.

It is suggested that the response to nitrogen alone on certain calcareous soils in the season under review has been due to the greater availability of the soil phosphate as a result of the abnormally wet weather in 1936. Both the Bodkins and the Millars soils are retentive of moisture.

It is obvious that the previous manurial history of a field as well as the nature of the soil is an important factor in determining the nutritional status and consequently the response to fertilizers. At Sandersons where the experimental site has been cropped for many seasons without manuring, the response to manurial applications has been larger although the actual yield has been lower than in any of the other plant cane experiments reaped, the no manure plots and the complete inorganic plots being respectively 25.2 and 35.6 tons per acre.

At Jolly Hill heavy yields have been obtained in all plots, viz. 48.4 to 49 tons per acre but there has been no response to fertilizers. Although the previous history of the field indicates only irregular treatment with pen manure, the experimental site received an unusually thorough cultivation. This fact, together with the heavy yield, would seem to indicate a high degree of fertility under which condition a large response to additional nutritional elements could not be expected.

With respect to time of application of fertilizers, inorganics as a rule were applied within two months of planting, exceptions being at Bodkins, Langfords and Winthorpes. At Langfords the gains in yield were small; at Winthorpes, although rather larger—3.3 tons per acre—the variety cultivated, B.147 (B.4507), was one which makes very slow growth during the first few months. At Bodkins the increase has been due entirely to nitrogen, and as already suggested, is independent of early applications of soluble phosphate.

There are indications that the degree of response to fertilizers is dependent to a great extent on the soil moisture at time of application. It has not, however, been found possible, to correlate response with rainfall at this period, since variations in moisture retention powers of the soils are important factors.

Three experiments with trash mulching were reaped during 1937. In the plant cane experiment at Winthorpes the gain from mulching in the absence of manures was small—1.5 tons per acre, but the gains in the presence of nitrogen only and in the presence of a complete inorganic manure were 3.8 tons and 6.1 tons respectively.

In the ratoon experiments the effect of trash mulching was not statistically significant. In neither experiment was Sulphate of Ammonia applied to the ratoons. Under such conditions the beneficial effect of trash mulching the plant canes does not extend to the ratoon crops. It is not improbable that there may be a conversion of soil nitrogen into a non available form by the organisms which decompose the trash.

The present series of experiments, together with those already recorded, indicates that considerable immediate gains in yield can be obtained by the application of inorganic fertilizers to Antigua soils and that these gains can exceed those resulting from an average application of pen manure.

The response to manurial treatment is dependent not only on soil type but on previous manurial treatment and rainfall.

Nitrogenous manures alone may produce immediate and residual gains on certain non calcareous soils. On calcareous soils, however, a response from

nitrogen depends on the presence of an adequate supply of available phosphate. This must ordinarily be supplied by applications of soluble phosphate, but under certain conditions soil phosphate may be adequate.

On certain soils of low calcium carbonate content the gains from nitrogen are greatly increased by the application of other fertilizers especially of phosphate, which in such soils may be fixed by calcium compounds other than calcium carbonate.

Potash appears to be needed on certain soils, but it is of less general importance to plant canes than nitrogen and phosphate. The beneficial effect of phosphate depends on its being available to the plant in the early stages of growth.

The gains in yield from inorganic manures are considerably increased in the presence of a trash mulch, but the residual beneficial effect of the mulch may in certain circumstances be small.

## COTTON SEED SELECTION.

The method followed in recent years of establishing a seed field on Thibous Estate with pedigree seed obtained from the Montserrat Agricultural Department was again adopted in 1937.

By this system a fresh supply of pedigree seed is obtained annually for multiplication at Thibous, and in the succeeding year the total acreage at Thibous (except the new pedigree seed field) is planted with the seed from this plot, and in addition as large an acreage elsewhere as is possible. Until 1937 it was found possble to plant the whole cotton acreage of Antgua either with seed from the Thibous pedigree seed field or with Thibous seed one generation further removed from the Montserrat pedigree seed, but the increased area planted in that year and the poor germination of some of the local seed resulting from the excessively wet crop season when the seed was reaped made it necessary to import some quantity of ordinary commercial Montserrat seed for general planting.

It is believed that sufficient seed from Thibous will be obtained in 1938 for planting the greater portion of the cotton area; climatic conditions at time of reaping were such as to allow of production of seed of good viability.

## LAND SETTLEMENT.

A detailed account of the progress of the various settlements during the year under review is contained in Appendix II. The following Table showing the quantity and the value of the cane crops from the settlements at Greencastle, Matthews, Jonas's and The Folly for the years 1931 to 1937 inclusive indicates the growth of these schemes since their inception in 1931:

| Year | 1932 | 1933 | 1934 | 1935 | 1936 | 1937 |
|---|---|---|---|---|---|---|
| Cane — tons .. .. | 405 | 1,924 | 2,907 | 2,716 | 5,127 | 6,960 |
| Gross Value £ .. .. | 258 | 1,342 | 2,044 | 1,878 | 3,544 | 5,242 |
| Marketing Charges £ * .. | 1 | 9 | 25 | 39 | 79 | 102 |
| Deductions £ ** .. | 84 | 350 | 471 | 488 | 616 | 673 |
| Cash paid allottees £ .. | 173 | 983 | 1,548 | 1,351 | 2,849 | 4,467 |

## AGRICULTURAL EDUCATION.

Monthly lectures to teachers in the Primary Schools were given by the Agricultural Superintendent.

## CORRESPONDENCE.

During the year 105 Minute Papers were dealt with, 222 letters were received and 466 despatched.

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* Weighing, packing and supervision.
** Rents and repayment of Loans.

## Agricultural Show.

An Agricultural, Horticultural and Industrial Exhibition was held under the auspices of the Antigua Agricultural and Commercial Society during January. This was the first Show held in Antigua since 1930.

## Official Visits.

Visits were paid to the Experiment Station by His Honour the Administrator, Mr. J. D. Harford, Mr. G. A. Jones, Dip. Agric., Commisioner of Agriculture, Mr. C. C. Skeete, B.A., Assistant Commissioner of Agriculture, Mr. P. E. Turner, M.Sc., F.I.C., Adviser in Sugar Cane Experiments to the Commissioner of Agriculture, Dr. McIntosh of the British West Indies Sugar Cane Breeding Station and Mr. H. E. Box, F.E.S., Entomologist in charge of Moth Borer Investigation.

## SECTION III. FINANCIAL STATEMENT AND STAFF OF THE DEPARTMENT.

### FINANCIAL STATEMENT.

| | Expenditure. | | | | | | Revenue. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Head VII. Agriculture. | | | | | | | | | | | | |
| Salaries .. .. .. | £ 1,185 | 17 | 11 | | | | | | | | | |
| House Allowances .. .. | 40 | 0 | 0 | | | | | | | | | |
| Transport Allowances .. | 199 | 18 | 8 | | | | | | | | | |
| Greencastle and Other Experimental work .. .. | 337 | 0 | 0 | | | | | | | | | |
| Sugar Cane Experiments .. | 100 | 0 | 0 | | | | | | | | | |
| Planting and Maintaining Trees | 29 | 19 | 11 | | | | | | | | | |
| Fumigation of Plants.. .. | | 8 | 0 | | | | | | | | | |
| Printing Reports and Contingencies .. .. .. | 19 | 8 | 9 | | | | | | | | | |
| Destruction of Wild Cotton and Okra plants .. .. | 45 | 13 | 1 | | | | | | | | | |
| Distribution of Cotton Seed .. | | 17 | 8 | | | | | | | | | |
| Distribution of Paris Green .. | 15 | 0 | 0 | | | | | | | | | |
| Contribution to Central Cane Breeding Station .. | 132 | 16 | 3 | | | | | | | | | |
| Agricultural Exhibition .. | 50 | 0 | 0 | | | | | | | | | |
| Upkeep of Botanic Station .. | 120 | 0 | 0 | 2,277 | 0 | 3 | | | | | | |
| Revenue of Experiment Station | | | | | | | 239 | 1 | 10 | | | |
| Profit on Sale of Onion and Vegetable Seeds .. .. | | | | | | | 6 | 11 | 8 | | | |
| Sale of Soil .. .. .. | | | | | | | | 2 | 0 | 245 | 15 | 6 |
| Head XV. Govt. Undertakings. | | | | | | | | | | | | |
| (2) Land Settlement. | | | | | | | | | | | | |
| Land Officer's Department. | | | | | | | | | | | | |
| Salary and Travelling .. | 55 | 12 | 1 | 55 | 12 | 1 | | | | | | |
| Agricultural Development. | | | | | | | | | | | | |
| Supervision .. .. | 41 | 10 | 0 | | | | | | | | | |
| Planting Material .. .. | 7 | 9 | 8 | | | | | | | | | |
| Drains .. .. .. | 37 | 0 | 9 | | | | | | | | | |
| Roads .. .. .. | 22 | 15 | 11 | | | | | | | | | |
| Miscellaneous .. .. | 8 | 7 | 2 | 117 | 3 | 6 | | | | | | |
| Payments for Land and Houses collected through Agric. Dept. .. .. .. | | | | | | | 425 | 15 | 0 | 425 | 15 | 0 |
| Advance Accounts. | | | | | | | | | | | | |
| Vegetable & Onion Seed A/c .. | 23 | 16 | 2 | | | | | | | | | |
| Fertilizer Account .. .. | 126 | 15 | 3 | | | | | | | | | |
| Cultivation Account .. .. | 258 | 12 | 6 | 409 | 3 | 11 | | | | | | |
| Sale of Vegetable & Onion Seeds. £30. 7. 10 less £6. 11. 8. transferred to revenue .. | | | | | | | 23 | 16 | 2 | | | |
| Fertilizer Account .. .. | | | | | | | 87 | 1 | 6 | | | |
| Cultivation Account: | | | | | | | | | | | | |
| Cash Payment .. .. | | | | | | | 3 | 9 | 6 | | | |
| Transferred from Agric. Development Department .. | | | | | | | 89 | 10 | 0 | | | |
| Transfer from Deposit A/c .. | | | | | | | 161 | 13 | 8 | 365 | 10 | 10 |
| Total Expenditure and Receipts | | | | 2,858 | 19 | 9 | | | | 1,037 | 1 | 4 |
| Deposit A/c—Sale of Crops. | | | | | | | | | | | | |
| Peasant Cane Payments .. | 4,494 | 9 | 4 | | | | | | | | | |
| Reaping Costs .. .. | 101 | 4 | 8 | | | | | | | | | |
| Transfer to Revenue—Produce of Experiment Station .. | 239 | 1 | 10 | | | | | | | | | |
| Transfer to Revenue—Payments for Land and Houses .. | 425 | 15 | 0 | | | | | | | | | |
| Transfer to Fertilizer A/c .. | 87 | 1 | 6 | | | | | | | | | |
| Transfer to Cultivation A/c .. | 161 | 13 | 8 | | | | | | | | | |
| Balance in Deposit A/c .. | | 5 | 9 | 5,509 | 11 | 9 | | | | | | |
| Receipt from sale of canes and other produce .. .. | | | | | | | £5,509 | 11 | 9 | £5,509 | 11 | 9 |

## STAFF OF THE DEPARTMENT.

| | |
|---|---|
| Agricultural Superintendent .. | F. H. S. Warneford, M.A., B.Sc., A.I.C., F.C.S. |
| Agricultural Assistant .. .. | Vacant. |
| Junior Assistant .. .. .. | V. G. Pereira. |
| Assistant Clerk (Office) 1st January—31st August .. .. .. | G. L. Bellot. |
| Assistant Clerk (Office) 1st September—31st December .. .. | S. L. Henry. |
| Field Assistant (Assistant Clerk) .. | C. K. G. Vieira. |
| Cotton Inspector .. .. .. | S. H. Abbott. |
| Foreman Experiment Station .. | R. E. M. Whyte. |

The Agricultural Superintendent was on Sick Leave from July 5th to July 8th. Mr. Abbott was on vacation leave from August 9th to September 18th. Mr. Vieira was on sick leave from January 25th to February 16th. The Foreman was on sick leave from January 1st to January 5th.

## SECTION IV. SUMMARY OF LEGISLATION AFFECTING PLANTS, ANIMALS, PRODUCE ETC.

The Legislation affecting plants, animals and produce remains essentially the same as was shewn in the summary included in the 1936 Report except for certain amendments to the Plant Import Prohibition Proclamation, the most important of which have been made in connection with the determined effort to prevent introduction of the cotton boll weevil which is now reported in Cuba and Haiti.

The Proclamation in force at the end of 1937 was issued on September 13th and the schedules are quoted below:

### THE FIRST SCHEDULE.

ARTICLES ABSOLUTELY PROHIBITED.

| Articles prohibited from importation. | Countries and places from whence importation prohibited. |
|---|---|
| (a) The fruit of the Banana .. | All countries and places except the United States of America and the other islands of the Leward Islands Colony. |
| (b) All fruits and plants of the citrus family and parts of such fruit and plants. | Cuba, Haiti, Santo Domingo, Venezuela, and the United States of America. |
| (c) All other fruit except<br>(i) plantains<br>(ii) nuts<br>(iii) canned, candied or other preserved fruits. | Bahamas, Bermuda, British Guiana, and all other countries and places except the British Isles, Canada, the British West Indies and the United States of America. |
| (d) All vegetables except<br>(i) onions<br>(ii) Irish potatoes<br>(iii) canned or preserved vegetables. | ditto ditto. |
| (e) Pimento and the Bay Tree (Pimento acris) | Jamaica. |
| (f) Cotton Seed, cotton seed hulls, cake and meal and other cotton seed products, seed cotton, cotton lint and any part of the cotton plant and any other malvaceous plant and any part thereof. | Cuba, Haiti, Santo Domingo. |

| Articles prohibited from importation. | Countries and places from whence importation prohibited. |
|---|---|
| (g) Fertilizers and stock feeds containing cotton seed meal. | Cuba, Haiti and Santo Domingo. |
| (h) Pillows and bedding material containing seed cotton, cotton lint or any part of the cotton plant. | ditto ditto. |
| (i) All agricultural produce in bags. | ditto ditto. |
| (j) Second-hand empty bags and baling material | ditto ditto. |
| (k) Packages, containers and coverings which contain or are reasonably suspected to have contained any of the articles specified in item (f) hereof. | ditto ditto. |
| (l) Personal baggage and effects of any description which contain or are reasonably suspected to have contained any of the articles specified in item (f) hereof. | ditto ditto. |
| (m) Personal baggage and effects of any description which have been in contact or in close proximity to other baggage, cargo, produce or articles of any description infected or reasonably suspected to be infected with the cotton boll wevil (Anthonomus grandis Boheman). | All countries and places. |
| (n) Articles which have formed part of the cargo of a ship another part of the cargo of which has been found to be infected or is reasonably suspected to be infected with the cotton boli weevil. (Anthonomus grandis Boheman). | All countries and places. |
| (o) Soil. | Bahamas, Bermuda, British Guiana, Trinidad, and all other countries and places except the British Isles, Canada, the other islands of the British West Indies not specified in this item, and the United States of America. |

## THE SECOND SCHEDULE.

### ARTICLES PROHIBITED CONDITIONALLY.

| Articles. | Conditions of importation. | Countries and place. |
|---|---|---|
| (a) Sugar cane, Sugar cane seedlings and plants, and all parts of the sugar cane. | Under license granted by the Governor. | All countries and places |
| (b) Banana plants and parts of banana plants. | ditto. | ditto. |
| (c) Cotton seed, cotton lint, seed cotton, and all packages, coverings, containers, bags and other articles and things which have been used as packings, coverings or bags for any cotton seed, cotton lint or seed cotton. | Under license granted by the Governor. | All countries and places other than Cuba, Haiti, Santo Domingo. |
| (d) Sprouted coconuts. | Under license granted by the Governor. | Trinidad, St. Vincent, St. Lucia, Grenada, Cuba, Jamaica, and all parts of Central and South America. |
| (e) All fruits and plants of the citrus family and parts of such fruit or plant. | Under license granted by the Governor. | All countries and places other than Cuba, Haiti, Santo Domingo, Jamaica, Venezuela, the United States of America and the other islands of the Leeward Islands Colony. |
| (f) Soil and plants growing in soil. | Under license granted by the Governor and subject to fumigation immediately on landing. | All countries and places. |
| (g) All other fruit except<br>(i) Plantains<br>(ii) Nuts<br>(iii) Dried, canned, candied or other processed fruits. | To be accompanied by a certificate of origin from a responsible authority stating that such fruit was not grown in a country or place from whence its importation is prohibited. | The British Isles, Canada, the United States of America and the British West Indies except the other Islands of the Leeward Islands Colony. |
| (h) All vegetables except:<br>(i) Onions<br>(ii) Irish Potatoes<br>(iii) Canned or preserved vegetables. | ditto. | ditto. |

## APPENDIX I.

## SUGAR CANE EXPERIMENTS.

### VARIETAL EXPERIMENTS.

#### A. EXPERIMENTS WITH PLANT CANES.

Variety Trial — High Point — Nibbs No. 5.
Soil Type — Fitches Clay.
Manurial Treatment — 25 tons Pen Manure per acre under the banks.
Planted—B.147 E 16/10/35, remainder 23/11/35.
Reaped—5—9/4/37.

| Rainfall. | | | Average rainfall for similar period based on returns for 10 years. | | |
|---|---|---|---|---|---|
| Oct.—Dec. | 1935 .. | 10.22 ins | Oct.—Dec. | 13.01 ins | |
| | 1936 .. | 47.38 „ | Jan.—Dec. | 37.57 „ | |
| Jan.—Apr. 5, | 1937 .. | 8.02 „ | Jan.—Mch. | 3.97 „ | |
| | | 65.62 „ | | 54.55 „ | |

Layout—One 6 x 6 Latin Square. Plot size 1/31 acre.

| Variety. | Yield of cane tons per acre. |
|---|---|
| B.2935 .. .. .. .. | 49.5 |
| Ba.11569 .. .. .. .. | 46.1 |
| B.891 .. .. .. .. | 41.8 |
| P.O.J.2878 .. .. .. | 37.4 |
| B.147 E .. .. .. | 37.2 |
| B.147 .. .. .. .. | 34.3 |

Differences in yield of canes exceeding 3.34 tons and 4.55 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

In this experiment all the varieties germinated well, the lowest germination being that of Ba.11569, viz 82% at first planting. B.2935 and Ba.11569 are the outstanding canes.

Variety Trial — Gaynors — Elms No. 5.
Soil Type — Fitches Clay.
Manurial Treatment — 25 tons Pen Manure per acre under the banks.
Planted — 16/11/35.
Reaped — 17—19/2/37.

| Rainfall. | | | Average Rainfall for similar period based on returns for 10 years. | | |
|---|---|---|---|---|---|
| Nov.—Dec. | 1935 .. | 6.55 ins | Nov.—Dec. .. | 9.71 ins | |
| | 1936 .. | 60.03 „ | Jan.—Dec. .. | 38.79 „ | |
| Jan.—Feb. | 16, 1937 .. | 8.75 „ | Jan.—Feb. .. | 2.51 „ | |
| Total | | 75.33 „ | Total | 51.01 „ | |

Layout—One 6 x 6 Latin Square. Plot size — 1/30 acre

| Vareity. | Yield of cane tons per acre |
|---|---|
| B.2935 .. .. .. .. | 63.4 |
| Ba.11569 .. .. .. .. | 55.5 |
| P.O.J.2878 .. .. .. | 55.3 |
| B.H.10.12 .. .. .. .. | 53.5 |
| B.726 .. .. .. .. | 51.9 |
| B.147 (B.4507) .. .. .. | 42.2 |

Differences in yield of canes exceeding 5.72 tons and 7.80 tons per acre might be due eo chance less than once in 20 times and once in 100 times respectively. B.2935 is significantly better than any of the other varieties.

Germination at first planting exceeded 90% except in the case of B.2935 (70%).

B.147 (B.4507) germinated well but suffered from the dry weather in December, 1935 and January, 1936. This variety should be planted early enough to be thoroughly established before the end of the wet season as it is intolerant of drought in the first few months of life.

Variety Trial — Yeamans — No. 3.
Soil Type—Transition between Fitches Clay and calcareous Gunthorpes Clay.
Manurial Treatment—20 tons Pen Manure per acre under cross hole bars.
Planted — 28/11/35.
Reaped — 16—19/3/37.

| Rainfall. | | | Average Rainfall for similar period based on returns for 10 years. | | |
|---|---|---|---|---|---|
| Dec. 1935 | .. | 1.90 ins | December .. | 4.35 ins | |
| 1936 | .. | 55.68 „ | Jan.—Dec. .. | 44.41 „ | |
| Jan.—Mch. 16, 1937 | .. | 10.18 „ | Jan.—Mch. .. | 5.48 „ | |
| Total | | 67.76 „ | Total | 54.24 „ | |

Layout—One 6 x 6 Latin Square. Plot size—1/28.4 acres.

| Variety. | Yield of cane tons per acre |
|---|---|
| B.2935 .. .. .. | .. 47.1 |
| Ba.11569 .. .. .. | .. 45.0 |
| B.726 .. .. .. | .. 44.3 |
| B.H.10.12 .. .. | .. 42.3 |
| B.891 .. .. .. | .. 42.0 |
| P.O.J.2878 .. .. | .. 40.3 |

Differences in yield of canes exceeding 3.88 tons and 5.29 tons per acre respectively might be due to chance less than once in 20 times and once in 100 times respectively.

Ba.11569 was not well established until February, 1936. The other varieties were readily established.

Variety Trial — Jolly Hill — Spring Piece.
Soil Type — Alluvial.
Manurial Treatment—No manure applied to the Plant canes.
Planted—9/11/35.
Reaped—22—28/4/37.

| Rainfall. | | | Average rainfall for similar period based on returns for 10 years. | | |
|---|---|---|---|---|---|
| Nov.—Dec. 1935 | .. | 4.43 ins | Nov.—Dec. .. | 9.90 ins | |
| 1936 | .. | 64.22 „ | Jan.—Dec. .. | 44.45 „ | |
| Jan.—Apr. 21, 1937 | .. | 17.88 „ | Jan.—Apr. .. | 7.66 „ | |
| Total | | 86.53 „ | Total | 62.01 „ | |

Layout—Two 5 x 5 Latin Squares. Plot area—1/29 acre.

| Variety. | Yield of cane—tons per acre | | |
|---|---|---|---|
| | Square 1 better drained. | Square 2 not so well drained. | Average for both squares. |
| P.O.J. 2878 .. .. | 45.7 | 41.2 | 43.45 |
| B. 2935 .. .. | 47.5 | 39.1 | 43.30 |
| Ba. 11569 .. .. | 43.7 | 39.4 | 41.55 |
| B. 726 .. .. | 41.1 | 40.2 | 40.65 |
| B.H. 10.12 .. .. | 40.8 | 39.6 | 40.20 |

Average differences in yield of cane exceeding 3.51 tons and 4.74 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

All varieties germinated well in this experiment.

### B. EXPERIMENTS WITH RATOONS.

Variety Trial—Sandersons No. 27.
Soil Type—Non calcareous Gunthorpes clay.
Planted—7—9.11.34.
Reaped as Plant Canes—5—6.3.36.
Reaped as 1st Ratoons—21—22.6.37.
Rainfall as 1st Rattons—82.46 ins.
Manurial Treatment as Plant Cane—Nil.
Manurial Treatment as 1st Ratoons—2 cwt. Sulphate of Ammonia per acre.
Layout—One 6 x 6 Latin Square—Plot size 1/30.3 acres.

| Variety. | Yield of canes 1st Ratoons | Tons per acre Plant canes | Total yield |
|---|---|---|---|
| B. 726 .. .. | 18.8 | 28.3 | 47.1 |
| Ba. 11569 .. .. | 19.5 | 27.3 | 46.8 |
| P.O.J. 2878 .. .. | 23.4 | 22.7 | 46.1 |
| B.H. 10.12 .. .. | 17.7 | 26.1 | 43.8 |
| S.C. 12.4 .. .. | 15.4 | 24.0 | 39.4 |
| B. 6308 .. .. | 17.6 | 21.3 | 38.9 |

Differences in yield of 1st Ratoons exceeding 3.90 and 5.32 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

Variety Trial—Parham New Work No. 19.
Soil Type—Lindsey Clay (Lagoon Clay).
Planted—19.10.34 (B.147E) and 13.12.34.
Reaped as plant Cane—14 & 15.4.36.
Reaped as 1st Ratoons—17.6.37.
Rainfall as 1st Ratoons—84.44 ins.
Manurial Treatment as Plant Cane—Nil.
Manurial Treatment as 1st Ratoons—2 cwt. Sulphate of Ammonia and 1½ cwt. Superphosphate per acre.
Layout—Four Randomised Blocks. Plot size 1/28.4 acres.

| Variety. | Yield of canes 1st Ratoons | Tons per acre Plant canes | Total. |
|---|---|---|---|
| P.O.J. 2878 .. .. | 14.2 | 27.3 | 41.5 |
| B. 2935 .. .. | 6.3 | 32.1 | 38.4 |
| B. 726 .. .. | 8.5 | 26.5 | 35.0 |
| B.H. 10.12 .. .. | 8.6 | 26.4 | 35.0 |
| G. 119 .. .. | 7.1 | 27.5 | 34.6 |
| B. 891 .. .. | 5.4 | 27.2 | 32.6 |
| S.C. 12.4 .. .. | 7.1 | 21.8 | 28.9 |
| B. 4507 (B. 147) .. | 3.2 | 23.3 | 26.5 |
| B. 4507 (B. 147)e. .. | 4.1 | 21.2 | 25.3 |

Differences in yield of 1st Ratoons exceeding 5.28 tons and 7.16 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

With the exception of P.O.J. 2878 all varieties in the experiment have failed completely as ratoons.

Variety Trial—Jolly Hill Wood Side Piece.
Soil Type—Alluvial Yorkes Clay.
Planted—26.10.34 (B. 4507.e) and 12.12.34.
Reaped as Plant Cane—1 & 2.4.36.
Reaped as 1st Ratoons—29 & 30.4.37.
Rainfall as 1st Ratoons—78.29 ins.
Manurial Treatment as Plant Cane—Nil.
Manurial Treatment as 1st Ratoons—2 cwt. Sulphate of Ammonia per acre.
Layout—Four Randomised Blocks. Plot size 1/28.5 acres.

| Variety. | Yield of canes 1st Ratoons | Tons per acre Plant canes | Total |
|---|---|---|---|
| P.O.J. 2878 .. .. | 31.5 | 35.0 | 66.5 |
| B.H. 10.12 .. .. | 25.9 | 31.4 | 57.3 |
| B. 6308 .. .. | 28.0 | 26.7 | 54.7 |
| B. 726 .. .. | 26.5 | 25.1 | 51.6 |
| S.C. 12.4 .. .. | 19.0 | 27.9 | 46.9 |
| B. 2935 .. .. | 17.5 | 28.2 | 45.7 |
| B. 4507 (B. 147)e. .. | 13.0 | 21.7 | 34.7 |
| B. 4507 (B. 147) .. | 11.9 | 14.6 | 26.5 |

Differences in yield of 1st Ratoons exceeding 4.31 tons and 5.86 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

Variety Trial—Collins No. 8.
Soil Type—Fitches Clay.
Planted—28.12.33.
Reaped as Plant Cane—12.3.35.
Reaped as 1st Ratoon—24.4.36.
Reaped as 2nd Ratoon—11.6.37.
Rainfall as 2nd Ratoon—66.55 ins.
Manurial Treatment as Plant Cane—2 cwt. Sulphate of Ammonia per acre.
Manurial Treatment as 1st Ratoons—Nil.
Manurial Treatment as 2nd Ratoons—Nil.
Layout—Four Randomised Blocks. Plot size 1/30 acre.

| Variety | Yield of canes—tons per acre | | | |
|---|---|---|---|---|
| | 2nd Ratoons | 1st Ratoons | Plant Canes | Total |
| B. 2935 .. .. | 22.2 | 20.5 | 28.8 | 71.5 |
| Ba. 11569 .. | 23.1 | 20.2 | 28.1 | 71.4 |
| B.H. 10.12 .. | 21.6 | 16.8 | 26.3 | 64.7 |
| B. 4507 (B. 147) .. | 20.1 | 19.8 | 22.3 | 62.2 |
| P.O.J. 2878 .. | 21.0 | 14.5 | 25.2 | 60.7 |
| B. 726 .. .. | 19.9 | 15.6 | 22.2 | 57.7 |
| S. C. 12.4 .. | 18.2 | 13.7 | 22.5 | 54.4 |

Differences in yield of 2nd Ratoons exceeding 3.72 tons and 5.09 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

Varietal Experiments have now been conducted on modern lines since 1933. The following Table shows the summarised results of these experiments. Certain small scale experiments reaped as plant canes in 1934 and as first ratoons in 1935 are not included in this summary as the layout was not entirely satisfactory. In the main, however, the results of these experiments were similar to those of the experiments here recorded.

## SUMMARY OF RESULTS OF VARIETAL EXPERIMENTS. 1933 — 1937.

Yield of Canes—Tons per acre.
Soil Type—Fitches Clay.

| | STATION AND YEAR. | | | | | | |
|---|---|---|---|---|---|---|---|
| | Millars 1933. | Thibous 1935. | Collins 1935. | High Point 1937. | Gaynors 1937. | Total. | Mean. |
| Crop .. | P.C. | P.C. | P.C. | P.C. | P.C. | | |
| Rainfall (ins.) | 70.46 | 38.01 | 44.34 | 65.62 | 75.33 | | |
| B. 2935 .. | | 16.1 | 28.8 | 49.5 | 63.4 | 157.8 | 39.4 |
| Ba. 11569 .. | 36.5 | 17.2 | 28.1 | 46.1 | 55.5 | 183.5 | 36.7 |
| P.O.J. 2878 .. | 52.5 | 13.1 | 25.2 | 37.4 | 55.3 | 183.5 | 36.7 |
| B. 147 .. | 24.6 | 7.7 | 22.3 | 37.2 | 42.2 | 134.0 | 26.8 |
| B.H. 10.12 .. | 36.2 | | 26.3 | | 53.5 | 116.0 | 38.7 |
| S.C. 12.4 .. | 36.4 | 10.7 | 22.5 | | | 69.6 | 23.2 |
| B.726 .. | | | 22.2 | | 51.9 | 74.1 | 37.0 |
| B.891 .. | | | | 41.8 | | 41.8 | 41.8 |
| B.417 .. | 38.9 | | | | | 38.9 | 38.9 |

STATION AND YEAR.

| | Millars 1934 | Thibous 1936. | Collins 1936. | Collins 1937. | Total. | Mean |
|---|---|---|---|---|---|---|
| Crop .. | 1st R. | 1st R. | 1st R. | 2nd R. | | |
| Rainfall (ins.) | 40.35 | 41.0 | 40.0 | 66.6 | | |
| B. 2935 .. | | 24.3 | 20.5 | 22.2 | 67.0 | 22.3 |
| Ba. 11569 .. | 19.8 | 25.3 | 20.2 | 23.1 | 88.4 | 22.1 |
| P.O.J. 2878 .. | 22.5 | 22.8 | 14.5 | 21.0 | 80.8 | 20.2 |
| B.147 .. | 23.1 | 17.9 | 19.8 | 20.1 | 80.9 | 20.2 |
| B.H. 10.12 .. | 18.7 | | 16.8 | 21.6 | 57.1 | 19.0 |
| S.C. 12.4 .. | 15.1 | 16.3 | 13.7 | 18.2 | 63.3 | 15.8 |
| B. 726 .. | | | 15.6 | 19.9 | 35.5 | 17.7 |
| B. 417 .. | 20.5 | | | | 20.5 | 20.5 |

Soil Type—Calcareous Gunthorpes Clay.

STATION AND YEAR.

| | Fitches Creek. 1933. | Yeamans 1937 | Total. | Mean. | Fitches Creek. 1934. |
|---|---|---|---|---|---|
| Crop .. | P. C. | P. C. | | | 1st R. |
| Rainfall (ins.) | 68.9 | 74.7 | | | 42.9 |
| B. 2935 .. | | 47.1 | 47.1 | 47.1 | |
| Ba. 11569 .. | 39.1 | 45.0 | 84.1 | 42.05 | 18.9 |
| P.O.J. 2878 .. | 37.6 | 40.3 | 77.9 | 39.0 | 17.5 |
| B.147 .. | 34.7 | | 34.7 | 34.7 | 13.8 |
| B.H.10.12 .. | 35.6 | 42.3 | 77.9 | 39.0 | 14.0 |
| G. 140 .. | 34.2 | | 34.2 | 34.2 | 12.5 |
| P.O.J. 213 .. | 32.4 | | 32.4 | 32.4 | 14.9 |
| B.891 .. | | 42.0 | 42.0 | 42.0 | |
| B. 726 .. | | 44.3 | 44.3 | 44.3 | |

Soil Type — Non-calcareous Gunthorpes clay.

STATION AND YEAR.

| Crop | Sandersons 1936 P. C. | Sandersons 1937 1st R. |
|---|---|---|
| Rainfall (ins.) .. .. .. | 45.82 | 82.46 |
| Ba.11569 .. .. .. .. | 27.3 | 19.5 |
| B.726 .. .. .. .. | 28.3 | 18.8 |
| P.O.J.2878 .. .. .. | 22.7 | 23.4 |
| B.H.10.12 .. .. .. | 26.1 | 17.7 |
| B.6308 .. .. .. .. | 21.3 | 17.6 |
| S.C.12.4 .. .. .. .. | 24.0 | 15.4 |

Soil Type — Lindsey Clay.

STATION AND YEAR.

| Crop | Parham New Work 1936 P. C. | Parham New Work 1937 1st R. |
|---|---|---|
| Rainfall (ins.) .. .. .. | 41.79 | 84.44 |
| P.O.J.2878 .. .. .. | 27.3 | 14.2 |
| B.2935 .. .. .. .. | 32.1 | 6.3 |
| B.726 .. .. .. .. | 26.5 | 8.5 |
| B.H.10.12 .. .. .. | 26.4 | 8.6 |
| G.119 .. .. .. .. | 27.5 | 7.1 |
| B.891 .. .. .. .. | 27.2 | 5.4 |
| S.C 12.4.. .. .. .. | 21.8 | 7.1 |
| B.147 .. .. .. .. | 23.3 | 3.2 |

Soil Type — Alluvial.

STATION AND YEAR.

| | Jolly Hill. | Jolly Hill. | Jolly Hill. | Total. | Mean. | Jolly Hill. | Jolly Hill. | Total. | Mean. |
|---|---|---|---|---|---|---|---|---|---|
| | 1933. | 1936, | 1937. | | | 1934. | 1937. | | |
| Crop ... | P. C. | P. C. | P. C | | | 1st R. | 1st R | | |
| Rainfall ... | 58·98 | 37·61 | 86·53 | | | 39·77 | 78·29 | | |
| P.O.J. 2878 | 23·6 | 35·0 | 43·5 | 102·1 | 34·0 | 20·8 | 31·5 | 52·3 | 26·1 |
| B.H. 10·12 ... | 20·1 | 31·4 | 40·2 | 91·7 | 30·6 | 16·5 | 25·9 | 42·4 | 21·2 |
| B. 726 | 23·7 | 25·1 | 40·7 | 89·5 | 29·8 | 18·5 | 26·5 | 45·0 | 22·5 |
| B. 2935 ... | ... | 28·2 | 43·3 | 71·5 | 35·7 | ... | 17·5 | 17·5 | 17·5 |
| Ba. 11569 ... | ... | ... | 41·6 | 41·6 | 41·6 | ... | ... | ... | ... |
| B. 6308 ... | ... | 26·7 | ... | 26·7 | 26·7 | ... | 28·0 | 28·0 | 28·0 |
| S.C. 12·4 ... | ... | 27·9 | ... | 27·9 | 27·9 | ... | 19·0 | 19·0 | 19·0 |
| B. 147 ... | ... | 21·7 | ... | 21·7 | 21·7 | ... | 13·0 | 13·0 | 13·0 |
| B· 891 ... | 21·5 | ... | ... | 21·5 | 21·5 | 19·2 | ... | 19·2 | 19·2 |
| B. 381 ... | 20·3 | ... | ... | 20·3 | 20·3 | 17·3 | ... | 17·3 | 17·3 |
| B. 374 ... | 19·1 | ... | ... | 19·1 | 19·1 | 16·7 | ... | 16·7 | 16·7 |

## MANURIAL EXPERIMENTS.

### A. EXPERIMENTS INCLUDING ORGANIC MANURES.

I. *Experiments with Pen Manure versus Sulphate of Ammonia and Pen Manure and a complete inorganic fertilizer.*

Estate—Pares and Cochranes. Field No. 10 Cochranes.
Soil Type—Fitches Clay. $CaCo_3$=13%.
Variety—B.H.10.12. Plant Cane 1936, 1st ratoons 1937.
Planted 4/1/35.
Reaped as Plant Cane—26/2/36 and as 1st ratoons 16/3/37.
Rainfall—38 ins. as Plant Canes; 69 ins. as ratoons.
Layout—Two 5 x 5 Latin Squares. Plot area 1/40 acre.

| Manurial Treatment per Acre as Plant Cane | Yield of canes — tons per acre. | | | Gain tons per acre |
|---|---|---|---|---|
| | Plant Cane | 1st Ratoon | Total | |
| Nil .. .. .. .. | 26.21 | 16.6 | 42.81 | |
| 12 tons Pen Manure 22/12/34 | 29.35 | 18.2 | 47.55 | + 4.74 |
| 24 „ „ „ 22/12/34 | 31.38 | 21.9 | 53.28 | +10.47 |
| 36 „ „ „ 22/12/34 | 31.53 | 22.8 | 54.33 | +11.52 |
| 2 cwt. Sulphate of Ammonia 29/5/35<br>2 cwt. Sulphate of Ammonia 9/8/35 | 25.90 | 16.2 | 42.10 | — 0.71 |

Difference in yield of 1st ratoons exceeding 2.05 tons per acre and 2.76 tons per acre might be due to chance less than once in 20 times and less than once in 100 times respectively.

Estate—Gaynors. Field Elms No. 11.
Soil Type—Fitches Clay. $CaCo_3$=50%.
Variety—Ba.11569. Plant Cane 1935, 1st ratoons 1936, 2nd ratoons 1937.
Planted—8/2/35.
Reaped as Plant Canes 16/4/35, as 1st ratoons 13/4/36 and as 2nd ratoons 22/7/37.
Rainfall 35 ins. as Plant Canes, 39 ins. as 1st ratoons and 75 ins. as 2nd ratoons.
Layout—Two 4 x 4 Latin squares and four randomised blocks.
Plot area—1/36.5 acres.

| Manurial Treatment per acre as Plant cane | Yield of canes — tons per acre. | | | Total | Gain tons per acre |
|---|---|---|---|---|---|
| | Plant Cane | 1st R. | 2nd R. | | |
| Nil .. .. | 26.56 | 26.16 | 32.40 | 85.12 | |
| 12 tons Pen Manure 5/7/34 .. | 32.65 | 29.90 | 36.50 | 99.15 | + 14.03 |
| 24 tons Pen Manure 5/7/34 .. | 34.62 | 32.71 | 36.00 | 103.33 | + 18.21 |
| 2 cwt. Sulph. Ammonia 12/7/34<br>2 cwt. Sulph. Ammonia 31/8/34 | 26.90 | 26.10 | 33.20 | 86.20 | + 1.08 |

Differences in yield of 2nd ratoons exceeding 2.67 tons and 3.60 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

Estate—Ottos. Field No. 23 S.
Soil Type—Ottos Clay. $CaCo_3$=0.4%.
Variety—B.H.10.12. Plant Cane 1936, 1st ratoon 1937.
Planted—3/1/35.
Reaped as Plant Cane 18/3/36, as 1st ratoon 14/5/37.
Rainfall—54 ins. as Plant Canes, 79 ins. as ratoons.
Layout—Two 5 x 5 Latin Squares. Plot area 1/22.8 acres.

| Manurial Treatment per Acre as Plant Cane | Yield of canes — tons per acre. | | | Gain tons per acre |
|---|---|---|---|---|
| | Plant Canes | 1st ratoons | Total | |
| Nil .. .. .. .. | 23.55 | 17.5 | 41.05 | |
| 8 tons Pen Manure 7/6/35 .. | 23.85 | 17.8 | 41.65 | + 0.6 |
| 16 „ „ „ 7/6/35 .. | 25.42 | 21.3 | 46.72 | + 5.67 |
| 3 cwt. Sulphate of Ammonia 14/6/35 .. | 23.36 | 17.7 | 41.06 | + 0.01 |
| 3 cwt. Sulphate of Ammonia 15/6/35<br>3 cwt. Superphosphate 15/6/35<br>2 cwt. $K_2SO_4$ 15/6/35 | 24.14 | 17.9 | 42.04 | + 0.99 |

Differences in yield of 1st ratoons exceeding 1.74 tons per acre and 2.35 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

II. *Experiments with Pen Manure versus Filter Press Mud.*

Estate—Thibous. Field—Blizzards No. 9.
Soil Type—Fitches Clay. $CaCo_3$=45%.
Variety—Ba.11569. Plant Cane 1936, 1st ratoon 1937.
Planted 30/11/34.
Reaped as Plant Cane 13/3/36, as 1st ratoon 7/2/37.
Rainfall—47 ins. at Plant Cane, 56 ins. as 1st ratoon.
Layout—Two 5 x 5 Latin Squares. Plot area—1/28 acre.

| Manurial Treatment per acre as Plant Cane. | Yield of canes — tons per acre. | | | Gain. tons per acre. |
|---|---|---|---|---|
| | Plant Cane | 1st Ratoon. | Total. | |
| Nil. | 30.93 | 27.80 | 58.73 | |
| 3 tons Filter press mud 30/4/35 | 31.75 | 31.80 | 63.55 | + 4.82 |
| 6 tons Filter press mud 30/4/35 | 30.33 | 35.60 | 65.93 | + 7.20 |
| 9 tons Filter press mud 30/4/35 | 31.74 | 38.60 | 70.34 | + 11.61 |
| 10 tons Pen Manure 17/4/35 .. | 31.22 | 33.60 | 64.82 | + 6.09 |

Differences in ratoon yields exceeding 3.56 tons per acre might be due to chance less than once in 100 times. The differences in Plant Cane yields were not statistically significant.

Estate—Yeamans. Field No. 4.
Soil Type—Fitches Clay. $CaCo_3$=18%.
Variety—Ba.11569. Plant Cane 1935, 1st ratoon 1936, 2nd ratoon 1937.
Planted 2/3/34.
Reaped as Plant Cane 5/4/35, as 1st ratoons 8/4/36, as 2nd ratoons 29/7/37.
Rainfall—41 ins. as Plant Cane, 39 ins. as 1st ratoon, 71 ins. as 2nd ratoon.
Layout—Two 5 x 5 Latin Squares. Plot area—1/29 acre.

| Manurial Treatment per acre As Plant Cane. | Yield of canes — tons per acre. | | | Total. | Gain. tons per acre. |
|---|---|---|---|---|---|
| | Plant Cane | 1st R. | 2nd R. | | |
| Nil. | 31.7 | 22.5 | 21.2 | 75.4 | |
| 3 tons Filter Press Mud 10/7/34 .. | 35.7 | 24.4 | 22.8 | 82.9 | + 7.5 |
| 6 tons Filter Press Mud 10/7/34 .. | 36.3 | 26.4 | 25.5 | 88.2 | + 12.8 |
| 9 tons Filter Press Mud 10/7/34 .. | 37.2 | 28.1 | 27.4 | 92.7 | + 17.3 |
| 10 tons Pen Manure 10/7/34 .. | 35.6 | 26.2 | 23.8 | 85.6 | + 10.2 |

Differences in yield of 2nd Ratoons exceeding 2.70 and 3.65 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

*III. Experiment—Sulphate of Ammonia on canes receiving a basal dressing of 10 tons Pen Manure per acre.*

Estate—Greencastle Experiment Station.
Soil Type—Alluvial, (Bendals Clay).
Variety—B.H.10.12. Plant Cane 1936; 1st ratoons 1937.
Planted 1/11/34.
Reaped as Plant Cane 25/3/36, as 1st ratoon 12/5/37.
Rainfall as Plant Cane 75 ins. as 1st ratoon 89 ins.
Layout—Two 5 x 5 Latin Squares. Plot area 1/24.3 acres.

| Treatment with S.A. per acre. As Plant Cane. | | Yield of canes — tons per acre. | | | Gain. tons per acre. |
|---|---|---|---|---|---|
| December 1934. | August, 1935. | Plant Cane | 1st ratoon. | Total. | |
| Nil. | Nil. | 32.58 | 30.40 | 62.98 | |
| Nil. | 2 cwt. | 33.51 | 31.80 | 65.31 | + 2.33 |
| Nil. | 3 cwt. | 33.21 | 32.70 | 65.91 | + 2.93 |
| 2 cwt. | 2 cwt. | 34.06 | 33.60 | 67.66 | + 4.68 |
| 2 cwt. | 3 cwt. | 33.78 | 34.80 | 68.58 | + 5.60 |

No Sulphate of Ammonia—30.4 tons per acre.
Late Sulphate of Ammonia only—32.25 tons per acre.
Early and Late Sulphate of Ammonia—34.20 tons per acre.

The residual effect of the Sulphate of Ammonia applied to the plant cane is statistically significant and the mean difference in yield of 1.95 tons per acre between plots receiving late Sulphate of Ammonia and those receiving early and late Sulphate of Ammonia might be due to chance less than once in 20 times.

IV. *Experiments with Sulphate of Ammonia, Superphosphate and Sulphate of Potash alone and in various combinations both in the presence and absence of Pen Manure.*

Estate—Long Lane. Field No. 9.
Soil Type—Fitches Clay. $CaCo_3$=30.90%
Variety—B.147 (B.4507).
Planted 17/10/35.
Reaped as Plant Cane 13/2/37.
Rainfall during growing period (16 months)=86 ins.
Layout—Four randomised blocks. Plot area 1/42.5 acre.

| Manurial Treatment per acre Inorganic Manures | Yield of cane — tons per acre | | |
|---|---|---|---|
| | No Pen Manure | 12.5 tons Pen Manure per acre. | Mean |
| Nil .. .. .. .. | 37.0 | 43.4 | 40.2 |
| 2 cwt. S.A. 9/12/35; 2 cwt S.A. 26/5/36 .. | 40.5 | 45.5 | 43.0 |
| 2 cwt. Super 9/12/35 .. .. .. | 42.7 | 39.5 | 41.1 |
| 2 cwt. $K_2SO_4$ 9/12/35 .. .. | 37.6 | 40.3 | 38.9 |
| 2 cwt. Super & 2 cwt. S.A. 9/12/35; 2 cwt. S.A. 26/5/36 .. .. | 38.8 | 39.7 | 39.2 |
| 2 cwt. $K_2SO_4$ & 2 cwt. S.A. 9/12/35; 2 cwt. S.A. 26/5/36 .. .. | 42.3 | 42.9 | 42.6 |
| 2 cwt. Super & 2 cwt. $K_2SO_4$ 9/12/35 .. | 40.6 | 44.5 | 42.5 |
| 2 cwt. Super, 2 cwt. $K_2SO_4$ & 2 cwt. S.A. 9/12/35; 2 cwt S.A. 26/5/36.. | 43.6 | 46.8 | 45.2 |
| Means of Plots with and without Pen Manure .. .. .. | 40.4 | 42.8 | |

The increase in yield from the complete inorganic manure is statistically significant as is also the average increase from Pen Manure.

Estate—Ffryes. Field No. 16.
Soil Type—Transition between Fitches clay and calcareous. Gunthorpes clay. $CaCo_3$=20.19%.
Variety—B.H.10.12.
Planted 21/11/35.
Reaped as Plant Cane—22/3/37.
Rainfall during growing period (16 months)—73 ins.
Layout—Six Randomised Blocks. Plot area—1/32 acres.

| Manurial Treatment per acre Inorganic manures. | Yield of canes—tons per acre. | | |
|---|---|---|---|
| | No Pen Manure | 15 tons Pen Manure per acre. | Mean |
| Nil .. .. .. .. | 48.1 | 50.8 | 49.4 |
| 2 cwt. S.A. 22/1/36, 2 cwt. S.A. 9/6/36 .. | 50.6 | 56.4 | 53.5 |
| 2 cwt Super 22/1/36 .. .. .. | 49.1 | 53.2 | 51.1 |
| 2 cwt. $K_2SO_4$ 22/1/36 .. .. | 47.4 | 55.2 | 51.3 |
| 2 cwt. Super & 2 cwt. S.A. 22/1/36; 2 cwt. S.A. 9/6/36 .. .. | 53.3 | 61.2 | 57.2 |
| 2 cwt $K_2SO_4$ & 2 cwt. S.A. 22/1/36; 2 cwt. S.A. 9/6/36 .. .. | 55.0 | 62.9 | 58.9 |
| 2 cwt Super & 2 cwt $K_2SO_4$ 22/1/36 .. | 48.3 | 52.8 | 50.5 |
| 2 cwt Super, 2 cwt $K_2SO_4$ & 2 cwt. S.A. 22/1/36; 2 cwt. S.A. 9/6/36 .. | 55.8 | 61.6 | 58.7 |
| Means of Plots with and without Pen Manure .. .. | 50.9 | 56.8 | |

The effect of Pen Manure is statistically significant and might be due to chance far less than once in 100 times.

Mean differences between treatments (12 replicates) exceeding 3.80 tons and 5.12 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

B. EXPERIMENTS WITH INORGANIC FERTILIZERS ONLY.

I. Residual effect of Sulphate of Ammonia applied to plant canes receiving no other manure.

Estate—Cochranes and Thomas'. Field Thomas' No. 6.
Soil Type—Calcareous Gunthorpes clay. $CaCo_3$=11%.
Variety—B.H.10.12. Plant cane 1936. 1st ratoons 1937.
Planted 1/11/34.
Reaped as Plant Cane 1/5/36, as 1st ratoons 3/6/37.
Rainfall as Plant cane—67 ins, as 1st ratoons—62 ins.
Layout—One 6 x 6 Latin Square. Plot area 1/24.2 acres.

| Manurial Treatment per acre as Plant cane. | Yield of canes—tons per acre | | |
|---|---|---|---|
| | Plant Cane | 1st ratoons | Total |
| No Sulphate of Ammonia .. .. | 20.75 | 15.6 | 36.35 |
| 2 cwt. Sulphate of Ammonia 15/8/35 .. | 22.10 | 17.05 | 39.15 |
| 2 cwt. Sulphate of Ammonia 21/12/34 } .. 2 cwt. Sulphate of Ammonia 15/8/35 } | 22.10 | 17.25 | 39.35 |

Differences in yield of 1st ratoons exceeding 1.59 tons per acre might be due to chance less than once in 20 times.

Sulphate of Ammonia applied to the plant canes has exerted a small residual effect on the 1st ratoons.

Estate—Willis Freemans. Field No. 5.
Soil Type—Ottos clay.
Variety—B.H.10.12. Plant cane 1936. 1st ratoons 1937.
Planted 31/10/34.
Reaped as Plant cane 4/3/36, as 1st ratoons 26/5/37.
Rainfall as Plant cane 55 ins., as 1st ratoons 72 ins.
Layout—One 6 x 6 Latin Square. Plot area—1/23.3 acres.

| Manural Treatment per acre as Plant Cane | Yield of canes—tons per acre. | | |
|---|---|---|---|
| | Plant Cane | 1st ratoons | Total |
| No Sulphate of Ammonia .. | 33.50 | 33.45 | 68.95 |
| 2 cwt. Sulphate of Ammonia 7/8/35 .. .. .. | 35.80 | 34.95 | 70.75 |
| 2 cwt. Sulphate of Ammonia 21/12/34 } 2 cwt. Sulphate of Ammonia 7/8/35 } | 36.00 | 34.60 | 70.60 |

Sulphate of Ammonia applied to the plant canes has exerted no residual effect on the 1st ratoons.

II. Sulphate of Ammonia on 1st Ratoons and residual effect on 2nd Ratoons —the plant canes having received pen manure.

Estate—Collins. Field—Elliots No. 4.
Soil Type—Calcareous marl. $CaCo_3$=19%.
Variety—B.H.10.12. 1st ratoons 1936, 2nd ratoons 1937.
Reaped as Plant cane 25/5/35.
Reaped as 1st ratoons 11/5/36, as 2nd ratoons 11/6/37.
Rainfall as 1st ratoons—39 ins., as 2nd ratoons—65.64 ins.
Layout—Four 3 x 3 Latin Squares. Plot area—1/32.3 acres.

| Manurial Treatment per acre as 1st Ratoons | Yield of canes—tons per acre. | | |
|---|---|---|---|
| | 1st ratoons | 2nd ratoons | Total |
| No Sulphate of Ammonia .. | 22.38 | 25.80 | 48.18 |
| 2.2 cwt. Sulphate of Ammonia | 24.37 | 28.60 | 52.97 |
| 4.4 cwt Sulphate of Ammonia | 24.59 | 28.30 | 52.89 |

Differences in yield of 2nd ratoons exceeding 210 tons and 2.92 tons per acre might be due to chance less than once in 20 times and once in 100 times respectively.

*III. Effect of a complete inorganic fertilizer on plant canes in the presence and absence of furrows.*

Estate—La Roches. Field No. 11.
Soil Type—Ottos clay.
Variety—B.H. 10.12.
Planted 12.11.35.
Reaped 28.1.37.
Rainfall during growing period (14½ months)—73 ins.
Layout—Four 4 x 4 Latin squares. Plot area—1/30.3 acres.

| Cultural and Manurial Treatment | Yield of Canes —tons per acre |
|---|---|
| No. furrows. No Manure .. .. .. .. | 38.7 |
| Furrows. No Manure .. .. .. .. .. | 39.2 |
| No furrows. {2 cwt. Super, 2 cwt. $K_2SO_4$ .. .. {3 cwt. Sulphate of Ammonia .. .. | 43.1 |
| Furrows. 2 cwt. Super, 2 cwt. $K_2SO_4$ 3 cwt. S.A. .. | 42.7 |
| Mean of No. Manure plots—32 replicates .. .. | 38.9 |
| Mean of Manured plots—32 replicates .. .. .. | 42.9 |
| Average gain from complete inorganic .. .. | 4.0 |

The gains from the complete inorganic manure are significant and might be due to chance far less than once in 100 times.

There was no difference between the flat and the banked plots.

*IV. Effect of Sulphate of Ammonia with and without Phosphate and Potash on Plant Cane.*

Estate—Collins. Field No. 12 w.
Soil Type—Fitches Clay. $CaCo_3$ =37.2%.
Variety—B.2935.
Planted 3.3.36. Reaped 20.2.37.
Rainfall during growing period (11½ months)—63.18 ins.
Layout—Two 5 x 5 Latin Squares. Plot Area—1/26 acre.

| Manurial Treatment per acre. | Yield of Canes —tons per acre |
|---|---|
| Nil .. .. .. .. .. .. | 39.9 |
| 3 cwt. Sulphate of Ammonia 27.4.36 .. .. .. | 40.7 |
| 3 cwt. Sulphate of Ammonia & 2 cwt. Super 27.4.36 .. | 40.3 |
| 3 cwt. Sulphate of Ammonia & 2 cwt. $K_2SO_4$ 27.4.36 .. | 41.9 |
| 3 cwt. Sulphate of Ammonia & 2 cwt. Super & 2 cwt. $K_2SO_4$ 27/4/36 .. .. .. .. .. .. | 41.9 |

Differences in yield exceeding 1.19 tons per acre might be due to chance less than once in 20 times. There has been a very small but significant increase in yield from Nitrogen when applied in the presence of Sulphate of Potash.

*V. Experiments with Inorganic Fertilizers on Plant Cane with special reference to Nitrogen.*

Estate—Langfords. Field—Mount Pleasant No. 2.
Soil Type—Fitches Clay. $CaCO_3$ =37.35%.
Variety—Ba. 11569.
Planted 26.11.35.
Reaped 2.2.37.
Rainfall during growing period (14 months)—61 ins.
Layout—Three 4 x 4 Latin Squares. Plot area—1/31.6 acres.

| Main Manurial Treatments per acre | Yield of Canes—tons per acre | |
|---|---|---|
| | No S.A. plots | S.A. plots |
| No Manure | 39.79 | 40.41 |
| 2 cwt. Super 27.3.36 .. .. .. | 40.77 | 41.90 |
| 2 cwt. $K_2SO_4$ 27.3.36 .. .. | 39.15 | 40.79 |
| 2 cwt. Super & 2 cwt. $K_2SO_4$ 27.3.36 .. | 40.85 | 42.12 |

| | |
|---|---|
| Mean Yield, No S.A. (48 plots)—40.14 tons per acre | |
| Mean Yield S.A. (48 „ )—41.31 „ „ „ | Gain due to S.A. 1.17 tons |
| „ „ No Super (48 „ )—40.03 „ „ „ | |
| „ „ Super (48 „ )—41.41 „ „ „ | Gain due to Super 1.38 tons |
| „ „ No Potash (48 „ )—40.72 „ „ „ | |
| „ „ Potash (48 „ )—40.73 „ „ „ | Gain due to Potash 0.01 tons |

The average gain of 1.17 tons cane due to nitrogen is statistically significant and might be due to chance less than once in 20 times, so is the average gain of 1.38 tons due to Superphosphate (S.D. for 1 in 20=1.03).

The effect of Potash is not statistically significant.

Estate—Sandersons. Field—Upper Freemans No. 8.
Soil Type—Gunthorpes Clay. $CaCo_3$.=1.18%.
Variety—B.H. 10.12.
Planted—14.11.35.
Reaped—23.3.37.
Rainfall during growing period (16¼ months)—87 ins.
Layout—Three 4 x 4 Latin Squares. Plot area—1/31.6 acres.

| Main Manurial Treatments per acre. | Yield of canes—tons per acre. | |
|---|---|---|
| | No S.A. plots | S.A. plots |
| No Manure .. .. .. | 25.2 | 27.9 |
| 2 cwt. Super 16.1.36 .. .. .. | 29.0 | 33.7 |
| 2 cwt. $K_2SO_4$ 16.1.36 .. .. | 26.7 | 28.7 |
| 2 cwt. Super & 2 cwt. $K_2SO_4$ 16.1.36 .. | 30.2 | 35.6 |

Tons per acre.
Mean Yield No S.A. (48 plots)—27.8
„ „ S.A. (48 „ )—31.5 Gain due to S.A.—3.7 tons
„ „ No Super (48 „ )—27.1
„ „ Super (48 „ )—32.1 Gain due to Super—5.0 tons
„ „ No Potash (48 „ )—28.9
„ „ Potash (48 „ )—30.3 Gain due to Potash—1.4 tons

The average gain in yield due to Nitrogen is highly significant and might be due to chance far less than once in 100 times (S.D. for 1 in 100=1.46).

The average gain due to phosphate is also significant and might be due to chance less than once in 100 times (S.D. 12 replicates for 1 in 100=1.34).

*VI. Experiments with Inorganic Fertilizers on Plant Cane with special reference to Phosphate.*

Estate—Millars. Field No. 1.
Soil Type—Fitches Clay. $Ca.Co_3$.=28.02%.
Variety—P.O.J. 2878.
Planted—5.11.35.
Reaped—6.3.37.
Rainfall during growing period (16 months)—80 ins.
Layout—One 6 x 6 Latin Square with half plots. Plot area—1/35.9 acres.

| Main Manurial Treatments per acre. | Yield of canes—tons per acre. | |
|---|---|---|
| | Plots without Super. | Plots with 2 cwt. Super per acre. |
| Nil .. .. .. .. | 43.46 | 45.76 |
| 2 cwt. $K_2SO_4$ 13.12.35 .. .. | 44.61 | 44.95 |
| 2 cwt. Sulphate of Ammonia 7.5.36 .. | 47.84 | 47.42 |
| 2 cwt. $K_2SO_4$ 13.12.35, 2 cwt. S.A. 7.5.36 | 47.40 | 48.69 |
| 2 cwt. S.A. 13.12.35, 2 cwt. S.A. 7.5.36 | 50.27 | 50.55 |
| 2 cwt. S.A. & 2 cwt. $K_2SO_4$ 13.12.35, 2 cwt. S.A. 7.5.36 .. .. | 49.56 | 50.64 |

Mean Yield, No Super (36 plots) 47.19 tons
„ „ 2 cwt. Super (36 „ ) 48.00 „ Gain from Super +0.81 tons
Mean Yield, No Potash (36 „ ) 47.55 „
„ „ 2 cwt. Potash (36 „ ) 47.64 „ Gain from Potash +0.09 tons
Mean Yield, No S.A. (24 „ ) 44.69 „
„ „ 2 cwt. S.A. (24 „ ) 47.84 „ Gain from 2 cwt. S.A. +3.15 tons
„ „ 4 cwt. S.A. (24 „ ) 50.25 „ Gain from 4 cwt. S.A. +5.56 tons

The gains from Superphosphate and from Potash are not statistically significant. The gains from Sulphate of Ammonia are statistically significant and might be due to chance less than once in 100 times.

Estate—Diamond. Field No. 7.
Soil Type—Fitches Clay. $CaCo_3$=7.29%
Variety—B.H.10.12.
Planted 19/11/35
Reaped 12/3/37.
Rainfall during growing period (15¾ months)—80 ins.
Layout—One 6 x 6 Latin Square with half plots. Plot area 1/33.2 acres.

| Main Manurial Treatments per acre. | Yield of canes—tons per acre. | |
|---|---|---|
| | Plots without Super. | Plots with 2 cwt. Super per acre. |
| Nil .. .. .. .. | 43.02 | 44.84 |
| 2 cwt. $K_2SO_4$ 10.1.36 .. .. | 44.41 | 45.93 |
| 2 cwt. S.A. 19.5.36 .. .. .. | 44.49 | 46.06 |
| 2 cwt. $K_2SO_4$ 10.1.36, 2 cwt. S.A. 19.5.36 | 43.01 | 46.04 |
| 2 cwt. S.A. 10.1.36, 2 cwt. S.A. 19.5.36 | 42.95 | 46.64 |
| 2 cwt. S.A. & 2 cwt. $K_2SO_4$ 10.1.36, 2 cwt. S.A. 19.5.36 .. .. | 43.27 | 46.87 |

Mean Yield—No Super (36 plots) 43.52 tons.
„ „ 2 cwt. Super (36 „ ) 46.06 „ Gain from Super—2.54 tons
„ „ No Potash (36 „ ) 44.83 „
„ „ 2 cwt. Potash (36 „ ) 44.92 „ Gain from Potash 0.09 tons

| | Without Super. | Gain. | With Super. | Gain. |
|---|---|---|---|---|
| „ „ No S.A. (24 plots) | 43.71 tons | | 45.38 tons | |
| „ „ 2 cwt. S.A. ( „ ) | 43.75 „ | + .04 tons | 46.05 „ | + .67 tons |
| „ „ 4 cwt. S.A. ( „ ) | 43.11 „ | — .64 „ | 46.76 „ | + 1.38 „ |

The gain due to Phosphate is statistically significant (S.D. for 0.01=1.79). The effects of Potash and Nitrogen are not significant.

Estate—Bodkins—Field No. 2.
Soil Type—Calcareous Gunthorpes Clay. Ca $Co_3$=6.77%.
Variety—Ba.11569.
Planted 19/12/35.
Reaped 28/5/37.
Rainfall during growing period (17½ months)—83 ins.
Layout—One 6 x 6 Latin Square with half plots. Plot area 1/35.8 acres.

| Main Manurial Treatments per acre. | Yield of canes—tons per acre. | |
|---|---|---|
| | Plots without Super. | Plots with 2 cwt. Super per acre. |
| Nil .. .. .. | 40.8 | 40.6 |
| 2 cwt. $K_2SO_4$ 10/3/36 .. .. | 41.6 | 41.2 |
| 2 cwt. Sulphate of Ammonia 4/6/36 .. | 44.4 | 43.6 |
| 2 cwt. $K_2SO_4$ 10/3/36, 2 cwt. S.A. 4/6/36 | 43.5 | 45.5 |
| 2 cwt. S.A. 10/3/36, 2 cwt. S.A. 4/6/36 .. | 45.5 | 45.2 |
| 2 cwt. S.A. & 2 cwt. $K_2SO_4$ 10/3/36, 2 cwt. S.A. 4/6/36 .. .. | 45.2 | 44.8 |

Mean Yield No Super (36 plots) 43.5 tons
„ „ 2 cwt. Super (36 „ ) 43.5 „ Gain from Super=Nil.
„ „ No Potash (36 „ ) 43.3 „
„ „ 2 cwt. Potash (36 „ ) 43.6 „ Gain from Potash= +0.3 tons
„ „ No. S. A. (24 „ ) 41.05 „
„ „ 2 cwt. S. A. (24 „ ) 44.25 „ Gain= + 3.20 tons.
„ „ 4 cwt. S. A. (24 „ ) 45.20 „ Gain= + 4.15 tons.

The gains from Nitrogen are significant and might be due to chance less than once in 100 times (S.D. for 0.0=3.14).

The effects of Phosphate and Potash are not significant.

*VII. Experiments with Inorganic Fertilizers on Plant Cane with special reference to Potash.*

Estate—Blackmans. Field No. 6.
Soil Type—Fitches Clay. $CaCo_3$=35.02%.
Variety—B.147 (B.4507).
Planted 25/10/35).
Reaped 30/2/37.
Rainfall—16¼ months—80 ins.
Layout—One 6 x 6 Latin Square with half plots. Plot area 1/28.5 acres.

| Main Manurial Treatments per acre. | Yield of Canes—tons per acre. | |
|---|---|---|
| | Plots without Potash. | Plots with 2 cwt. $K_2SO_4$ per acre. |
| Nil .. .. .. | 33.28 | 33.83 |
| 2 cwt. Super 20/12/35 .. .. | 35.79 | 34.44 |
| 2 cwt. S.A. 17/6/36 .. .. | 33.30 | 34.20 |
| 2 cwt. Super 20/12/35, 2 cwt. S.A. 17/6/36 | 33.16 | 35.84 |
| 2 cwt. S.A. 20/12/35, 2 cwt. S.A. 17/6/36 | 32.75 | 32.96 |
| 2 cwt. S. A. and 2 cwt. Super 20/12/35, 2 cwt. S. A. 17/6/36 .. .. | 34.40 | 34.07 |

Mean Yield—No $K_2SO_4$ ... (36 plots) 33.78 tons.
„ „ 2 cwt. $K_2SO_4$ per acre (36 plots) 34.22 tons. Gain from Potash =0.44 tons
„ „ No Super (36 „ ) 33.39 „
„ „ 2 cwt. Super „ „ (36 „ ) 34.62 „ Gain from Super =1.23 „
„ „ No S.A. (24 „ ) 34.33 „
„ „ 2 cwt. S.A. „ „ (24 „ ) 34.12 „ Gain from Nitrogen=0.21 „
„ „ 4 cwt. S.A. „ „ (24 „ ) 33.54 „ Gain from Nitrogen=0.79 „

The average effects of Sulphate of Ammonia and Potash are not significant. The gains due to Superphosphate are statistically significant.

Estate—Jolly Hill. Field Spring Piece.
Soil Type—Alluvial Leonards Loam. Non calcareous.
Variety—B.H.10.12.
Planted 7/11/35.
Reaped 15/4/37.
Rainfall during growing period (17¼ months)—86 ins.
Layout—One 6 x 6 Latin Square with half plots. Plot area 1/32.8 acres.

| Main Manurial Treatments per acre. | Yield of canes—tons per acre. Plots without Potash | Plots with 2 cwt. $K_2SO^4$ per acre |
|---|---|---|
| Nil .. .. .. .. | 48.4 | 47.6 |
| 2 cwt. Super 7.1.36 .. .. .. | 47.5 | 47.6 |
| 2 cwt. S.A. 12.5.36 .. .. .. | 48.4 | 49.3 |
| 2 cwt. Super 7.1.36, 2 cwt. S.A. 12.5.36 .. | 47.8 | 48.7 |
| 2 cwt. S.A. 7.1.36, 2 cwt. S.A. 12.5.36 .. | 49.5 | 46.8 |
| 2 cwt. S.A. & 2 cwt. Super 7.1.36, 2 cwt. S.A. 12.5.36 .. .. .. | 47.3 | 49.0 |

In this experiment none of the fertilizers applied produced statistically significant effects

*VIII. Effect of Sulphate of Ammonia in presence of residual N.P.K.*

Estate—Carlisle. Field No. 15.
Soil Type—Calcareous Gunthorpes Clay ($CaCo_3$ = 26%.)
Variety—B.H.10.12.
Planted 25/10/34.
Reaped 25/2/36 as plants, 9/3/37 as 1st ratoons.
Rainfall—62 ins. as plants (16 months).
69 ins. as ratoons (12½ months).
Layout—Two 5 x 5 Latin Squares (with nitrogen half plots for ratoons).
Plot area—1/49.6 acres.

| Manurial Treatment per acre to plants | | Yield of canes—tons per acre. 1st ratoons. | | |
|---|---|---|---|---|
| Dec. 1934 | June 1935 | P. C. | Plots without S.A. | Plots with 2.8 cwt. S.A. |
| Nil. | Nil .. .. | 16.45 | 12.60 | 14.46 |
| Nil. | 2 cwt. S. A. .. .. | 16.91 | 12.12 | 14.96 |
| Nil. | 2 cwt. S. A., 2 cwt. Super, 2. cwt. $K_2SO_4$ .. .. | 15.98 | 11.66 | 15.07 |
| 2 cwt. S.A. | 2 cwt. S. A. .. .. | 16.49 | 11.77 | 13.05 |
| 2 cwt. S.A. | 2 cwt. S. A., 2 cwt. Super, 2. cwt. $K_2SO_4$ .. .. | 16.75 | 12.05 | 14.75 |

Mean Yield No Nitrogen plots 12.04 tons per acre.
„ „ Nitrogen plots 14.46 „ „ „ Gain from S.A. 2.42 tons.

The average gain from Sulphate of Ammonia is statistically significant and might be due to chance less than once in 100 times.

In this experiment the residual effect of the manures applied to the plant cane crop is not significant. The manures produced no significant effect on the plant canes.

Estate — Parrys. Field No. 1.
Soil Type — Fitches Clay. ($CaCo_3$ = 16%).
Variety — B.H.10.12.
Planted 25/10/34.
Reaped 28/2/36 as plants, 19/3/37 as 1st ratoons.
Rainfall — 62 ins. as plants (16 months).
69 ins. as ratoons (12¾ months).
Layout — Two 5 x 5 Latin Squares (with nitrogen half plots as 1st ratoons).
Plot area — 1/48.4 acres.

| Manurial Treatment per acre to plants | | Yield of canes — tons per acre. | | |
|---|---|---|---|---|
| Dec. 1934 | July 1935 | P.C. | 1st ratoons Plots without S.A. | 1st ratoons Plots with 3.1 cwt. S.A. |
| Nil | Nil .. .. .. | 30.88 | 22.50 | 27.18 |
| Nil | 2 cwt S.A. .. .. | 31.88 | 22.62 | 26.41 |
| Nil | 2 cwt. S.A., 2 cwt Super, 2 cwt $K_2SO_4$ . .. | 32.11 | 25.54 | 28.67 |
| 2 cwt S.A. | 2 cwt S.A. .. .. | 31.28 | 21.40 | 25.30 |
| 2 cwt. S.A. | 2 cwt S.A. 2 cwt. Super, 2 cwt $K_2SO_4$ .. .. | 32.35 | 23.25 | 28.84 |

Mean Yield of No Nitrogen Plots 23.06 tons per acre.
„ „ „ Nitrogen plots 27.28 „ „ „ Gain from S.A. 4.22 tons
„ „ „ Plots without residual P.K. 24.23 tons per acre.
„ „ „ Plots with „ P.K. 26.57 „ „ „ Gain from P.K. 2.34 tons.

The gains due to Sulphate of Ammonia applied to the ratoons and to the residual effect of Super and $K_2SO_4$ applied to the plant cane crop are both statically significant and might be due to chance far less than once in 100 times. The manures produced no significant effect on the plant cane crop.

C. Experiments with Trash Mulch.

(1) Residual effects of Trash mulching applied with and without S.A. to the plant cane crop.

Estate — Collins. Field Elliotts No. 11.
Soil Type — Fitches Clay. $CaCo_3$ = 19.44%.
Variety — B.147 (B.4507).
Planted 18/10/34.
Reaped 22/4/36 as plant cane, 7/6/37 as ratoons.
Rainfall — 61 ins. as plant cane, 67 ins. as ratoons.
Layout — One 6 x 6 Latin Square. Plot area — 1/23.5 acres.

| Cultural & Manurial Treatment per acre as Plant Cane. | Yield of canes—tons per acre | | |
|---|---|---|---|
| | Plant Cane | 1st ratoon | Total |
| Mulched No S.A. .. .. .. | 34.71 | 26.50 | 61.21 |
| Mulched 2 cwt S.A. .. .. .. | 33.77 | 26.50 | 60.27 |
| Mulched 4 cwt S.A. .. .. .. | 35.15 | 27.20 | 62.35 |
| No mulch No S.A. .. .. .. | 30.00 | 28.10 | 58.10 |
| No mulch 2 cwt S.A. .. .. .. | 30.90 | 28.00 | 58.90 |
| No mulch 4 cwt S.A. .. .. .. | 29.53 | 28.60 | 58.13 |
| Mean Yield of Mulched Plots .. | 34.54 | 26.73 | |
| Mean Yield of Unmulched Plots .. | 30.14 | 28.23 | |

Differences in yield of 1st ratoons due to Trash Mulch are not statistically significant. The residual effects of the Sulphate of Ammonia applied to the Plant Cane are not significant.

Estate — Coconut Hall. Field No. 11.
Soil Type — Fitches Clay. Ca. $Co_3$ =16.72%.
Variety — B.147 (B.4507).
Planted — 10.11.34.
Reaped 30/4/36 as plant cane, 15/6/37 as 1st ratoons.
Rainfall — 53 ins. as plant cane, 76 ins. as 1st ratoons.
Layout — One 6 x 6 Latin Square. Plot area 1/21.7 acres.

| Cultural & Manurial Treatment per acre as Plant Cane. | Yield of canes—tons per acre | | |
|---|---|---|---|
| | Plant Cane | 1st Ratoon. | Total. |
| Mulched No S.A. .. .. .. | 21.66 | 15.9 | 37.56 |
| Mulched 2 cwt S.A. .. .. | 21.08 | 20.1 | 41.18 |
| Mulched 4 cwt. S.A. .. .. | 23.62 | 16.4 | 40.02 |
| No Mulch No. S.A. .. .. .. | 14.42 | 16.2 | 30.62 |
| No Mulch 2 cwt S.A. .. .. .. | 15.50 | 16.0 | 31.50 |
| No Mulch 4 cwt S.A. .. .. .. | 16.37 | 17.1 | 33.47 |
| Yield of canes—tons per acre. .. | 22.12 | 17.5 | |
| Mean Yield of Unmulched Plots .. | 15.43 | 16.4 | |

Differences in yield of 1st ratoons to Trash Mulch are not statistically significant. There has been a small residual effect from Sulphate of Ammonia applied late to the plant canes.

*II. Trash Mulching applied with and without Sulphate of Ammonia and a complete inorganic Manure on plant cane.*

Estate — Winthorpes. Field No. 10.
Soil Type — Fitches Clay. $CaCO_3$=46.35%.
Variety — B.147 (B.4507).
Planted 18/10/35.
Reaped 30/4/37.
Rainfall during growing period (18½ months).
Layout — One 6 x 6 Latin Square. Plot area — 1/30 acres.

| Manurial & Cultural Treatment per acre | Yield of canes per acre. |
|---|---|
| Trash Mulch. No Manure .. .. .. .. | 34.3 |
| Trash Mulch. 3 cwt S.A. .. .. .. .. | 37.2 |
| Trash Mulch. 3 cwt S.A., 2 cwt Super, 2 cwt $K_2SO_4$ .. | 42.2 |
| No Mulch. No Manure .. .. .. | 32.8 |
| No Mulch. 3 cwt S.A. .. .. .. .. | 33.4 |
| No Mulch 3 cwt S.A., 2 cwt Super, 2 cwt $K_2SO_4$ .. | 36.1 |
| Average yield, 18 mulched plots .. .. .. | 37.9 |
| „ „ 18 unmulched plots .. .. .. | 34.1 |
| „ „ 12 No manure plots .. .. .. | 33.5 |
| „ „ 12 S.A. plots .. .. .. .. | 35.3 |
| „ „ 12 complete Inorganic plots .. .. | 39.1 |

The average gain due to Trash Mulch is significant and might be due to chance less than once in 100 times.

The mean differences between manurial tratments exceeding 2.32 tons and 3.16 tons per acre might be due to chance less than once in 20 times once in 100 times respectively.

## APPENDIX II.

## LAND SETTLEMENT.

*Greencastle.* At the end of December 101 allotments, the total available, were occupied. Of these 99 were arable plots and the remaining 2 a shop site and a pasture lot respectivly.

There were no evictions during the year but two allottees voluntarily transferred their plots, and there were three transfers as a result of the death of the holders.

The faults noted in earlier reports, viz. inadequate drainage, failure to keep growing crops weeded and late cultivation and planting of the cane crop, are still common. It is customary for many of the allottees to plant sweet potatoes in the latter half of the year and to reap this crop before recultivating the same land for cane. While it is desirable that every allottee should grow some food crop it would be preferable if the sweet potato area were reduced as, apart from the resulting delay in planting the money crop—cane, there is almost always a glut of sweet potatoes early in the year with correspondingly poor prices.

Allottees continue to realise increasingly the value of manure. During 1937 they received advances totalling £80. 1. 0. for purchase of fertilizers as compared with £65. 7. 0. for the same purpose during 1936.

Advances made for cultivation and reaping during 1937 amounted to £74. 18. 6. Unfortunately it was not possible to obtain the services of the gyrotiller; implemental tillage, when obtainable, is of great assistance, especially on an estate where the soil is heavy and very hard to work by hand in dry weather.

During 1937 £5. 7. 8. was spent on providing planting material for new allottees; £29. 16. 5. on opening main drains, and £2. 11. 8. on estate roads.

The 1937 crop was reaped from 205 acres and amounted to 3,766 tons. It was sold to Bendals Factory at 14/- per ton.

The 1938 crop will be reaped from 238 acres, and is estimated at about 3,300 tons.

*Matthews.* At the end of December 119 allotments out of a total of 137 were occupied. There were no evictions during the year.

Advances of £5. 0. 0. and £65. 4. 0. were made for purchase of fertilizers and for cultivation or reaping respectively, and £7. 4. 4. and £15. 19. 3. spent on main drains and estate roads.

The 1937 crop was reaped from 136 acres and amounted to 1,361 tons which were sold to the Antigua Sugar Factory for 14/- a ton with a subsidiary payment of 2/4.3319d. per ton. Allottees also received a Cartage Allowance of 6d. per ton.

The 1938 crop will be reaped from 117 acres and is estimated at 1,112 tons.

*Jonas's.* At the end of December 64 lots out of a total of 64 available arable lots were occupied. Twelve pasture lots on the poorer land were also taken up. There were no evictions during the year.

Advances of £14. 11. 8. and £37. 0. 0. were made for purchase of fertilizers and for cultivation or reaping respectively, and £1. 11. 6. and £4. 15. 0. were spent on planting material for new allottees and on estate roads respectively.

The 1937 crop was reaped from 99 acres and amounted to 1,662 tons. It was sold to the Antigua Sugar Factory for 14/- a ton with a subsidiary payment of 2/4.3319d. per ton.

The 1938 crop will be reaped from 102 acres and is estimated at 1,445 tons.

*The Folly.* A small block of land situated at the Folly, originally purchased in connection with a water development scheme but for the time rented to a limited number of peasants, passed under the control of the Department during 1937.

The 1937 crop amounted to 161 tons which was marketed through the Department to Bendals Factory at 13/- per ton.

The following Table shows the allocation of the cane crop revenues from the four estates during the period under review. The total gross receipts amounted to £5,242. 9. 0¾; the total reaping, packing and weighing charges to £101. 4. 8½; and the unpaid balances to 9/10½, so that the allottees received £5,140. 14. 5¾ either in cash, fertilizer or in instalments of the purchase price of their land.

STATEMENT SHOWING ALLOCATION OF CROP REVENUES FROM THE LAND SETTLEMENT SCHEMES, 1937.

| Settlement. | Tonnage | Total Value Received. | Rents Deducted. | Agric. Loans Repaid. | Marketing Charges.* | Net Proceeds Paid. | Balance Unpaid. |
|---|---|---|---|---|---|---|---|
| | | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. |
| Greencastle ... | 3,766 | 2,636 14 11¾ | 228 2 7½ | 148 9 8 | 8 8 6½ | 2,251 12 4¾ | 0 1 9 |
| Matthews ... | 1,361 | 1,144 12 10 | 91 17 7 | 44 10 11 | 39 12 8 | 968 5 2 | 6 6 |
| Jonas's ... | 1,662 | 1,356 12 6 | 86 1 11 | 54 17 8 | 48 9 9 | 1,167 1 10 | 1 4 |
| The Folly ... | 161 | 104 8 9 | 19 12 10½ | ... | 4 13 9 | 80 1 10 | 3½ |
| Total ... | 6,950 | 5,242 9 0¾ | 425 15 0 | 247 18 3 | 101 4 8½ | 4,467 1 2¾ | 9 10½ |

* Greencastle Weighing ½d per ton
Matthews ,, 1d per ton
,, Packing 4d per ton
Supervision 2d per ton
Jonas's as at Matthews
The Folly Weighing ½d per ton
Packing 4d per ton
Supervision 2d per ton

## APPENDIX III.

### METEOROLOGICAL

### RETURN OF RAINFALL OF THE FOLLOWING PLACES IN ANTIGUA FROM 1ST JANUARY TO 31ST DECEMBER, 1937.

| No. | Station. | January. | February | March | April. | May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Blakes ... ... | 10·21 | 3·11 | 0·69 | 6·39 | 1·21 | 0·88 | 4·20 | 6·03 | 8·64 | 3·08 | 10·82 | 6·69 | 61·95 |
| 2 | Botanic Station ... | 9·40 | 4·33 | 0·95 | 6·72 | 1·70 | 1·18 | 6·01 | 6·60 | 5·25 | 6·89 | 9·58 | 3·19 | 61·80 |
| 3 | Creekside ... ... | 8·49 | 3·75 | 1·26 | 3·49 | 1·94 | 1·05 | 5·35 | 5·90 | 5·74 | 11·10 | 9·35 | 2·75 | 60·17 |
| 4 | Morris Looby's ... | 9·43 | 5·22 | 0·50 | 6·13 | 1·31 | 0·48 | 3·63 | 5·78 | 8·30 | 3·00 | 10·49 | 5·76 | 60·03 |
| 5 | Antigua Sugar Factory ... ... | 10·40 | 3·91 | 0.91 | 5·04 | 1·63 | 1·05 | 5·13 | 6·70 | 7·78 | 4·51 | 9·07 | 2·81 | 58 94 |
| 6 | Ottos ... ... | 12·24 | 3·38 | 0·99 | 3·60 | 0·95 | 2·66 | 6·11 | 6·59 | 3·30 | 6·67 | 8·40 | 3·70 | 58·59 |
| 7 | Pattersons ... | 10·37 | 3·58 | 0·76 | 5·51 | 0·56 | 1·01 | 3·25 | 4·87 | 8·77 | 3·51 | 11·02 | 3·96 | 57·17 |
| 8 | Body Ponds ... | 10·51 | 4·58 | 1·13 | 4·56 | 2·18 | 1·17 | 3·74 | 5·97 | 5·45 | 3·75 | 10·50 | 2·21 | 55·75 |
| 9 | Wallings Hill ... | 12·41 | 4·01 | 2·15 | 1·58 | 1·40 | 0·89 | 3·39 | 4·24 | 6·60 | 3·61 | 10·74 | 4·24 | 55·26 |
| 10 | Wallings Dam ... | 12·22 | 4·12 | 2·03 | 1·50 | 1·40 | 0·85 | 3·42 | 4·70 | 6·70 | 3·61 | 10·22 | 3·55 | 54·32 |
| 11 | Vernons ... ... | 11·97 | 4·15 | 0·91 | 5·11 | 1·78 | 1·45 | 4·19 | 5·83 | 4·44 | 2·28 | 9·88 | 1·68 | 53·67 |
| 12 | Bennett Bryson's Office ... ... | 9·01 | 3·38 | 0·71 | 3·76 | 1·79 | 1·33 | 5·10 | 6·60 | 5·02 | 5·54 | 8·42 | 2·96 | 53·62 |
| 13 | Weirs ... ... | 8·45 | 4·63 | 1·59 | 6·65 | 1·41 | 2·56 | 4·90 | 5·03 | 5·63 | 3·25 | 6·74 | 2·30 | 53·14 |
| 14 | Cochrnes and Thomases ... | 8·40 | 2·53 | 0·32 | 4·77 | 1·26 | 0·55 | 3·84 | 4·73 | 7·19 | 3·59 | 10·09 | 5·55 | 52·82 |
| 15 | New Division ... | 9·85 | 2·60 | 0·96 | 4·28 | 2·05 | 1·48 | 4·19 | 5·85 | 4·01 | 5·35 | 8·33 | 2·90 | 51·85 |
| 16 | Sandersons ... | 8·80 | 2·75 | 0·98 | 5·73 | 1·67 | 1·02 | 3·42 | 5·94 | 7·07 | 4·28 | 8·95 | 1·20 | 51·81 |
| 17 | Belmont ... ... | 7·84 | 3·73 | 0·75 | 2·92 | 1·58 | 1·16 | 4·78 | 5·41 | 6·34 | 10·85 | 3·53 | 2·60 | 51·49 |
| 18 | Bendals Factory ... | 8·86 | 2·28 | 1·04 | 3·96 | 1·59 | 1·31 | 3·20 | 5·74 | 5·12 | 5·28 | 10·42 | 2·54 | 51·34 |
| 19 | Willis Freemans ... | 7·48 | 3·17 | 0·50 | 5·07 | 1·14 | 0·74 | 3·80 | 3·79 | 10·39 | 2·73 | 9·24 | 3·00 | 51·05 |
| 20 | Yorkes ... ... | 8·66 | 2·88 | 1·85 | 3·84 | 2·08 | 2·15 | 3·68 | 5·11 | 6·08 | 3·93 | 7·70 | 2·83 | 50·79 |
| 21 | Five Islands ... | 5·84 | 2·90 | 0.79 | 5·85 | 1·11 | 1·30 | 3·84 | 5·50 | 5·66 | 5·39 | 9·31 | 3·21 | 50·70 |
| 22 | Parham New Works | 9·41 | 3.49 | 0·92 | 5·00 | 1·55 | 1·20 | 4·05 | 7·57 | 6·19 | 1·58 | 7·89 | 1·56 | 50·41 |
| 23 | Burkes ... ... | 7·82 | 3·44 | 0·29 | 4·77 | 1·12 | 0·92 | 3·37 | 5·02 | 9·03 | 2·63 | 9·24 | 2·51 | 50·16 |
| 24 | Delaps ... ... | 9·70 | 1·70 | 0·69 | 5·57 | 0·80 | 0·70 | 4.20 | 5·05 | 6·63 | 2·51 | 9·20 | 2·85 | 49·60 |
| 25 | Belvidere ... ... | 9·95 | 2·49 | 1·12 | 4·33 | 1·64 | 0·96 | 3·24 | 5·36 | 4·57 | 3·74 | 9·89 | 1·99 | 49·19 |
| 26 | Diamond ... ... | 8·12 | 2·05 | 0·96 | 5·62 | 1·03 | 1·48 | 3·34 | 5·57 | 5·79 | 2·28 | 9·71 | 2·35 | 48·30 |
| 27 | Carlisle .. ... | 9·22 | 2·90 | 0.77 | 3·95 | 1.49 | 1·04 | 4·60 | 6·01 | 3·50 | 3·40 | 8·90 | 2·10 | 47·88 |
| 28 | Paynters ... ... | 8·29 | 4·23 | 0 65 | 3·96 | 1·44 | 1·22 | 4·30 | 5·66 | 3·99 | 3·26 | 8·21 | 2·32 | 47·53 |
| 29 | Cedar Valley ... | 9·09 | 6·09 | 0·47 | 3·74 | 1·78 | 0·66 | 4·44 | 5·68 | 3·82 | 2·45 | 6·75 | 2·14 | 47·11 |
| 30 | North Sound ... | 7·98 | 3·28 | 0·76 | 4·50 | 1·20 | 0·73 | 4·25 | 5·26 | 4·58 | 3·46 | 8·67 | 1·79 | 46·46 |
| 31 | Fitches Creek ... | 8·10 | 3·86 | 0·45 | 3·79 | 1·06 | 0·87 | 5·13 | 6·29 | 3·96 | 3·36 | 7·85 | 1·69 | 46·41 |
| 32 | Blackmans ... | 8·69 | 3·06 | 0·64 | 3·91 | 0·35 | 0·58 | 5·22 | 5·64 | 5·16 | 3·79 | 6·82 | 1·95 | 45·81 |
| 33 | Parham Hill ... | 10·00 | 3·44 | 0·72 | 5·20 | 1·17 | 1·05 | 3·71 | 5·33 | 3·62 | 1·73 | 8·10 | 1·66 | 45·73 |

## RETURN OF RAINFALL OF THE FOLLOWING PLACES IN ANTIGUA FROM 1ST JANUARY TO 31ST DECEMBER, 1937.

| No. | Station | January | February | March | April | May | June | July. | August | September | October | November | December | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 34 | Donovans ... | 9·02 | 3·56 | 1·00 | 4·09 | 0·55 | 0·79 | 4·85 | 5·80 | 4·05 | 2·69 | 7·09 | 2·06 | 45·55 |
| 35 | Ffryes ... ... | 8.98 | 1·99 | 0·62 | 4·82 | 10·8 | 1·06 | 2·24 | 4·77 | 3·17 | 3·51 | 8·31 | 4·88 | 45·43 |
| 36 | Parham Lodge ... | 9·03 | 3·16 | 0·75 | 4·50 | 1·15 | 0·74 | 3·49 | 6·92 | 3·64 | 3·12 | 6·86 | 1·36 | 45·02 |
| 37 | Duers ... ... | 7·46 | 2·29 | 0·70 | 4·13 | 0·97 | 1·01 | 2·94 | 4·48 | 7·01 | 2·76 | 6·91 | 3·35 | 44·01 |
| 38 | Gaynors .. | 6·72 | 3·46 | 0·58 | 5·34 | 0·91 | 1·17 | 2·56 | 5·07 | 4·37 | 1·83 | 8·41 | 3·53 | 43·95 |
| 39 | Yeptons ... ... | 7·44 | 1·76 | 0·90 | 3·30 | 1·28 | 1·24 | 4·89 | 5·30 | 4·36 | 4·41 | 6·54 | 2·16 | 43·58 |
| 40 | Millars ... ... | 8·46 | 2·60 | 0·77 | 3.60 | 1·80 | 1·04 | 4·20 | 5·10 | 3·20 | 3·14 | 7·60 | 2·04 | 43·55 |
| 41 | Marble Hill ... | 8·13 | 1·15 | 0·55 | 6·05 | 1·20 | 0·76 | 4·27 | 4·05 | 4·40 | 4·00 | 6·95 | 1·52 | 43·03 |
| 42 | Long Lane ... | 9·20 | 1·90 | 0·59 | 4·66 | 1·04 | 0·89 | 3·31 | 4·83 | 3·38 | 1·94 | 7·08 | 4·09 | 42·91 |
| 43 | Pares & Cochranes | 8·62 | 1·86 | 0·72 | 4·45 | 0·54 | 1·55 | 3·64 | 4·89 | 4·07 | 2·47 | 8·12 | 1·79 | 42·72 |
| 44 | Montpelier .. | 6·44 | 2·44 | 0·81 | 5.79 | 1.43 | 0·74 | 2·67 | 4·21 | 3·47 | 2·18 | 8·38 | 3·32 | 41·88 |
| 45 | Lyons ... ... | 7·29 | 2·58 | 0·60 | 4·99 | 1·14 | 0·50 | 2·90 | 4·66 | 3·67 | 2·07 | 7·54 | 3·65 | 41·59 |
| 46 | Betty's Hope ... | 6·59 | 2·49 | 1·05 | 4.47 | 0·70 | 1·47 | 3·38 | 4·31 | 4·12 | 2·28 | 8·17 | 2·53 | 41·56 |
| 47 | Langfords . | 8·70 | 3·29 | 0.39 | 3·48 | 2·10 | 0·96 | 3·13 | 1·43 | 4·56 | 2·63 | 8·20 | 2·16 | 41·03 |
| 48 | Judges ... .. | 8·07 | 2·32 | 0·00 | 3·48 | 1·30 | 0·67 | 3·52 | 6·38 | 3·27 | 2·73 | 7·13 | 1·57 | 40·44 |
| 49 | Betty's Hope Garden ... | 7·60 | 1·75 | 0·60 | 4·45 | 0·36 | 1·22 | 2·79 | 4·62 | 4.03 | 2·02 | 7·58 | 3·12 | 40·14 |
| 50 | Collins ... ... | 6·13 | 2·92 | 0·89 | 3.95 | 1·16 | 1·27 | 3·02 | 3·98 | 4·07 | 1.84 | 6·70 | 3·87 | 39·80 |
| 51 | Gilberts ... ... | 7·05 | 3·22 | 1·03 | 4·37 | 0·72 | 1·05 | 3·39 | 4·49 | 3·22 | 2·31 | 6·88 | 1·84 | 39·57 |
| 52 | Cassada Garden ... | 7·95 | 3·03 | 0·69 | 3·26 | 1·24 | 0·51 | 4·46 | 5·01 | 2·77 | 2·38 | 5·69 | 2·21 | 39·20 |
| 53 | The Cotton ... | 8·24 | 3·48 | 0·45 | 4·37 | 0·21 | 0·67 | 3·53 | 4·30 | 3·04 | 2·57 | 5·88 | 1·65 | 38·39 |
| 54 | Comfort Hall ... | 6·97 | 2·62 | 0·62 | 3·05 | 0·46 | 0·92 | 2·95 | 3·60 | 4·78 | 2·78 | 6·92 | 2·44 | 38·11 |
| 55 | Mercers Creek ... | 6·59 | 3·16 | 0·74 | 4·64 | 0·51 | 0·77 | 3·18 | 4·12 | 3·33 | 2·52 | 6·58 | 1·74 | 37·88 |
| 56 | Thibous ... ... | 7·87 | 2·38 | 0·00 | 3·63 | 0·81 | 0·73 | 3·39 | 3·53 | 3·80 | 2·42 | 6·97 | 1·13 | 36·66 |
| 57 | Cedar Hill ... | 6·10 | 2·61 | 0·00 | 3·69 | 0·81 | 0·35 | 3·83 | 3·74 | 3·93 | 2·94 | 6·53 | 0·93 | 35·46 |
| 58 | Winthorpes ... | 6·36 | 2·10 | 1·13 | 2·00 | 1·50 | 0·30 | 3·17 | 4·00 | 3·26 | 2·33 | 6·83 | 1·50 | 34·48 |
| 59 | High Point ... | 5·52 | 1·84 | 0·26 | 3·48 | 0·59 | 0·63 | 3.13 | 5·07 | 2·90 | 2·55 | 5·78 | 1·07 | 32·82 |
| Mean | | 8·54 | 3·07 | 0·79 | 4·39 | 1·22 | 1·03 | 3·86 | 5·15 | 4·99 | 3·47 | 8·13 | 2·64 | 47·28 |
| | Barbuda ... ... | 4·49 | 1·54 | 0·18 | 4·70 | 0·15 | 0·61 | 1·65 | 1·28 | 4·29 | 2·86 | 3·00 | 0·96 | 25·71 |

## AVERAGE RAINFALL 1874—1937.

| | | | | | | | | ins. |
|---|---|---|---|---|---|---|---|---|
| In | 1874 | the | average | rainfall | on | 41 | stations | was 31.16 |
| | 1875 | ,, | ,, | ,, | ,, | 40 | ,, | ,, 28.78 |
| | 1876 | ,, | ,, | ,, | ,, | 36 | ,, | ,, 41.98 |
| | 1877 | ,, | ,, | ,, | ,, | 38 | ,, | ,, 49.05 |
| | 1878 | ,, | ,, | ,, | ,, | 53 | ,, | ,, 47.11 |
| | 1879 | ,, | ,, | ,, | ,, | 52 | ,, | ,, 61.54 |
| | 1880 | ,, | ,, | ,, | ,, | 46 | ,, | ,, 49.68 |
| | 1881 | ,, | ,, | ,, | ,, | 44 | ,, | ,, 53.75 |
| | 1882 | ,, | ,, | ,, | ,, | 45 | ,, | ,, 33.04 |
| | 1883 | ,, | ,, | ,, | ,, | 56 | ,, | ,, 55.51 |
| | 1884 | ,, | ,, | ,, | ,, | 56 | ,, | ,, 43.98 |
| | 1885 | ,, | ,, | ,, | ,, | 53 | ,, | ,, 43.39 |
| | 1886 | ,, | ,, | ,, | ,, | 55 | ,, | ,, 47.78 |
| | 1887 | ,, | ,, | ,, | ,, | 50 | ,, | ,, 43.68 |
| | 1888 | ,, | ,, | ,, | ,, | 47 | ,, | ,, 44.23 |
| | 1889 | ,, | ,, | ,, | ,, | 50 | ,, | ,, 73.59 |
| | 1890 | ,, | ,, | ,, | ,, | 45 | ,, | ,, 33.00 |
| | 1891 | ,, | ,, | ,, | ,, | 45 | ,, | ,, 50.01 |
| | 1892 | ,, | ,, | ,, | ,, | 53 | ,, | ,, 38.43 |
| | 1893 | ,, | ,, | ,, | ,, | 54 | ,, | ,, 38.69 |
| | 1894 | ,, | ,, | ,, | ,, | 68 | ,, | ,, 38.85 |
| | 1895 | ,, | ,, | ,, | ,, | 69 | ,, | ,, 52.91 |
| | 1896 | ,, | ,, | ,, | ,, | 56 | ,, | ,, 59.85 |
| | 1897 | ,, | ,, | ,, | ,, | 54 | ,, | ,, 39.67 |
| | 1898 | ,, | ,, | ,, | ,, | 66 | ,, | ,, 48.85 |
| | 1899 | ,, | ,, | ,, | ,, | 63 | ,, | ,, 47.50 |
| | 1900 | ,, | ,, | ,, | ,, | 64 | ,, | ,, 36.95 |
| | 1901 | ,, | ,, | ,, | ,, | 65 | ,, | ,, 57.61 |
| | 1902 | ,, | ,, | ,, | ,, | 71 | ,, | ,, 58.80 |
| | 1903 | ,, | ,, | ,, | ,, | 68 | ,, | ,, 43.68 |
| | 1904 | ,, | ,, | ,, | ,, | 70 | ,, | ,, 37.01 |
| | 1905 | ,, | ,, | ,, | ,, | 68 | ,, | ,, 31.40 |
| | 1906 | ,, | ,, | ,, | ,, | 66 | ,, | ,, 53.93 |
| | 1907 | ,, | ,, | ,, | ,, | 70 | ,, | ,, 43.45 |
| | 1908 | ,, | ,, | ,, | ,, | 72 | ,, | ,, 43.79 |
| | 1909 | ,, | ,, | ,, | ,, | 70 | ,, | ,, 45.15 |
| | 1910 | ,, | ,, | ,, | ,, | 70 | ,, | ,, 34.77 |
| | 1911 | ,, | ,, | ,, | ,, | 72 | ,, | ,, 36.47 |
| | 1912 | ,, | ,, | ,, | ,, | 72 | ,, | ,, 32.20 |
| | 1913 | ,, | ,, | ,, | ,, | 73 | ,, | ,, 42.76 |
| | 1914 | ,, | ,, | ,, | ,, | 72 | ,, | ,, 36.86 |
| | 1915 | ,, | ,, | ,, | ,, | 75 | ,, | ,, 56.14 |
| | 1916 | ,, | ,, | ,, | ,, | 74 | ,, | ,, 58.23 |
| | 1917 | ,, | ,, | ,, | ,, | 70 | ,, | ,, 36.62 |
| | 1918 | ,, | ,, | ,, | ,, | 70 | ,, | ,, 37.87 |
| | 1919 | ,, | ,, | ,, | ,, | 70 | ,, | ,, 49.56 |
| | 1920 | ,, | ,, | ,, | ,, | 70 | ,, | ,, 30.09 |
| | 1921 | ,, | ,, | ,, | ,, | 74 | ,, | ,, 30.32 |
| | 1922 | ,, | ,, | ,, | ,, | 70 | ,, | ,, 35.14 |
| | 1923 | ,, | ,, | ,, | ,, | 68 | ,, | ,, 32.41 |
| | 1924 | ,, | ,, | ,, | ,, | 67 | ,, | ,, 41.57 |
| | 1925 | ,, | ,, | ,, | ,, | 68 | ,, | ,, 30.75 |
| | 1926 | ,, | ,, | ,, | ,, | 70 | ,, | ,, 50.20 |
| | 1927 | ,, | ,, | ,, | ,, | 67 | ,, | ,, 45.84 |
| | 1928 | ,, | ,, | ,, | ,, | 63 | ,, | ,, 33.24 |
| | 1929 | ,, | ,, | ,, | ,, | 66 | ,, | ,, 40.78 |
| | 1930 | ,, | ,, | ,, | ,, | 59 | ,, | ,, 25.51 |
| | 1931 | ,, | ,, | ,, | ,, | 63 | ,, | ,, 48.62 |
| | 1932 | ,, | ,, | ,, | ,, | 63 | ,, | ,, 58.47 |
| | 1933 | ,, | ,, | ,, | ,, | 59 | ,, | ,, 41.50 |
| | 1934 | ,, | ,, | ,, | ,, | 60 | ,, | ,, 41.86 |
| | 1935 | ,, | ,, | ,, | ,, | 57 | ,, | ,, 38.31 |
| | 1936 | ,, | ,, | ,, | ,, | 60 | ,, | ,, 59.99 |
| | 1937 | ,, | ,, | ,, | ,, | 59 | ,, | ,, 47.28 |

### AVERAGE MONTHLY RAINFALL, 1937.

| | inches. |
|---|---|
| January .. | 8.54 |
| February .. | 3.07 |
| March .. | 0.79 |
| April .. | 4.39 |
| May .. | 1.22 |
| June .. | 1.03 |
| July .. | 3.86 |
| August .. | 5.15 |
| September | 4.99 |
| October .. | 3.47 |
| November .. | 8.13 |
| December .. | 2.64 |
| | 47.28 |

The average rainfall for 64 years is 43.67 inches, so that the rainfall for the year 1937 is 3.61 inches above the average.

## METEOROLOGICAL SUMMARY, 1937.

### Kept at the Botanic Station, Antigua.

| Month | Thermometer | | | | | | | | Barometer Reading | | Rainfall Botanic Station | Barometer Corrected | | Thermometer | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dry | | Wet | | Relative Humidity | | Maximum | Minimum | | | | | | | |
| | 9 A.M. | 3 P.M. | 9 A.M. | 3 P.M. | 9 A.M. | 3 P.M. | | | 9 A.M. | 3 P.M. | | Highest | Lowest | Highest Max. | Lowest Min. |
| January ... | 75·7 | 77·7 | 72·8 | 73·8 | 86·4 | 82·9 | 80·4 | 70·0 | 30·087 | 30·003 | 9·40 | 30·169 | 29·939 | 82·0 | 67·0 |
| February ... | 76·7 | 78·0 | 73·0 | 74·3 | 83·0 | 83·2 | 80·9 | 69·0 | 30·075 | 30·005 | 4·33 | 30·143 | 29·926 | 84·0 | 66·0 |
| March ... | 78·4 | 80·5 | 73·6 | 74·7 | 79·2 | 71·4 | 84·0 | 71·1 | 30·061 | 30·002 | 0·95 | 30·121 | 29·941 | 87·0 | 67·0 |
| April ... | 78·7 | 80·6 | 75·2 | 76·6 | 85·1 | 82·1 | 83·7 | 71·5 | 30·064 | 29·997 | 6·72 | 30·157 | 29·911 | 89·0 | 69·0 |
| May ... | 81·8 | 84·1 | 77·0 | 78·3 | 80·0 | 76·6 | 87·8 | 74·5 | 30·010 | 29·965 | 1·70 | 30·075 | 29·918 | 91·0 | 71·0 |
| June ... | 83·5 | 85·1 | 78·6 | 79·4 | 79·8 | 79·3 | 88·3 | 76·4 | 30·074 | 30·034 | 1·18 | 30·125 | 29·965 | 90·0 | 71·0 |
| July ... | 84·1 | 85·5 | 77·4 | 78·0 | 69·7 | 70·7 | 88·3 | 76·0 | 30·063 | 30·022 | 6·01 | 30·147 | 29·947 | 91·0 | 73·0 |
| August ... | 83·4 | 85·6 | 79·5 | 80·5 | 80·0 | 74·9 | 87·9 | 75·6 | 30·021 | 29·965 | 6·60 | 30·103 | 29·882 | 89·0 | 71·0 |
| September ... | 85·1 | 85·7 | 81·5 | 82·1 | 85·0 | 85·8 | 89·7 | 75·8 | 29·961 | 29·904 | 5·25 | 30·025 | 29·860 | 93·0 | 72·0 |
| October ... | 83·4 | 83·0 | 79·9 | 79·7 | 86·9 | 87·5 | 87·0 | 74·4 | 29·957 | 29·898 | 6·89 | 30·013 | 29·843 | 90·0 | 70·0 |
| November ... | 81·4 | 82·6 | 79·0 | 79·9 | 90·0 | 88·4 | 85·5 | 74·2 | 29·954 | 29·869 | 9·58 | 30·024 | 29·712 | 89·0 | 71·0 |
| December ... | 78·9 | 79·6 | 74·8 | 74·5 | 82·4 | 79·0 | 82·7 | 71·9 | 29·995 | 29·944 | 3·19 | 30·097 | 29·883 | 87·0 | 69·0 |
| | | | | | | | | | | | 61·80 | | | | |
| Means for the Year ... | 80·9 | 82·3 | 76.8 | 77·6 | 82·5 | 80.1 | 85·5 | 73·4 | 30·028 | 29·967 | | | | | |

Highest Maximum Temperature = 93° on 12th and 13th September.
Lowest Minimum Temperature = 66° on 20th February.
Highest Barometer (corr.) = 30.169 on 19th January.
Lowest Barometer (corr.) = 29.712 on 11th November.
Greatest Rainfall in 24 hours = 3.93 ins. on 8th August.

## PART II.

# Peasant Agricultural Development and Marketing Department

This branch of the Department of Agriculture, inaugurated in 1936, continued its activities during the year under review with marked advancement as the following details of its operations show:—

### NURSERIES AND SEEDS.

The free distribution system of plants and seeds to peasants was continued, and judging from the great numbers of peasants who sought after planting material it is evident that the system is much appreciated. This free gift of planting material of approved crops resulted in a decided renascence of agricultural activity by the peasants and brought into cultivation a fair acreage of land lying uncultivated for many years. A further proof of the usefulness of the system was reflected in the increased production and export of these approved crops fostered by the Department, while the local market was supplied with an abundance of green vegetables for local consumption.

In order to make contacts with the peasants, district nurseries were set up with an "overlooker" in charge of the nursery to act as a liaison officer between the Department and the peasants. The following districts were given nurseries up to the end of 1937:—Piccadilly, Follies, Comfort Hall, Colebrooks, Liberta, Botanic Station, Newfields and Cades Bay.

The following plants and seeds were distributed during the year from these nurseries:—

*Seeds*: Tomato, 54 lbs.; Carrots, 38 lbs.; Kentucky Beans, 28 lbs.; String Beans, 10 lbs.; Pole Lima, 2 lbs.; Bush Lima, 2 lbs.; Onion, 23 lbs.; Beet, 36 lbs.; Turnip, 25 lbs.; Cabbage, 12 lbs.; Cauliflower, 5 lbs.; Cucumber, 4 lbs.; Egg-plant, 2 lbs.; Lettuce, 1 lb.

*Plants*: Tomato, 328,259: Onion, 24,578; Cauliflower, 5,528, Cabbage, 658; Egg-plant, 125.

In addition to the above, a large number of sour orange stocks were grown at the Follies and sent out in nursery beds for budding purposes. Grapefruit and oranges will be budded on these stocks for supplying peasants in the more sheltered and wetter districts of the island.

### SUGAR CANE

The establishment of nurseries for supplying peasants with best varieties of canes suitable to the districts and at the right time of planting was started towards the end of the year. Arrangements to market canes grown by peasants on their own land co-operatively through this office are being made and it is hoped that a start will be made in the coming year.

The progress of the peasant sugar cane industry continues to show rapid increase. Starting in 1907 with supplying a few hundred tons of canes, the peasants this season grew and supplied the factories with 60,000 tons approximately.

The present arrangements for marketing peasants' canes is not entirely satisfactory but can be improved by the co-operative method being aimed at by this office.

Increasing numbers of the population of the island are becoming cane farmers. Many estates have now gone out of estate cultivation and the proprietors of same appear to prefer to rent their lands to the labourers rather than cultivate them. An increasing number of estates are going out of estate cultivation and adopting this rental system.

This change over of certain sugar estates to the rental system is being carefully observed by this office, which is prepared to assist in any approved scheme of co-operative marketing should the parties interested seek the assistance and co-operation of this office.

## COTTON

Cotton growing was fostered generally by the Peasants' Agricultural Office and special attention was given to the development of the industry in the Government Land Settlements at the Piccadilly and in the island of Barbuda.

On the whole the wet season of 1936-37 was most unfavourable for cotton growing but in spite of this a fair start was made in instructing peasants on cotton growing and the co-operative marketing of the crop grown at the Piccadilly and in Barbuda.

Of the 950 acres planted in the island, approximately 500 acres were grown by the peasants. The total crop produced in the island was 96,940 lbs. lint, of which the peasants produced 54,740 lbs. or approximately 60%.

Peasants are very keen on cotton growing and given a little encouragement and assistance this crop should form a valuable second industry in the island.

At the Piccadilly Settlement the industry was further assisted by the granting of a small loan to growers, all the cotton produced in this Settlement was marketed co-operatively through this office with the Antigua Cotton Factory. Peasants received 1/6 per lb. lint net Cotton Factory and so derived the full benefit of the value of their produce.

The results of the Piccadilly cotton crop are as follows:—

14,428 lbs. seed cotton reaped from which 4,488 lbs. lint were obtained after ginning. The % of lint reached the high figure of 31.08. The crop was sold to the Antigua Cotton Factory at 1/6 per lb. and the sum of £336. 7. 9. derived therefrom was divided up pro rata among the contributing growers.

The furtherance of this industry will be one of the special items of activity in the programme of rehabilitation of peasant agriculture.

## BARBUDA COTTON

As far back as 1916 the people of Barbuda were encouraged to plant cotton and fair results attended their efforts at the start.

The vicissitudes which this industry has always been subjected to in this Presidency and the lack of any proper organization to promote the Agricultural resources of Barbuda were responsible for the complete disappearance of cotton growing in the latter island for the past 12 years or more.

With the inauguration of the Peasants' Agricultural Office, interest in cotton growing was aroused in the island and every effort made to resuscitate cotton growing on commercial lines.

To this end, free cotton seed was given to the island and the Agricultural Instructor sent over to Barbuda to distribute the seed and give advice on cotton growing to the people.

As a result of this, a start was made during the year under review and a crop of 11,603 lbs. seed cotton produced. From this, 3,652 lbs. lint was obtained and sold to the Antigua Cotton Factory at 1/6 per lb. net. This brought in a sum of £273. 10. 0. to the island and was much appreciated as the monetary resources of this island are decidedly limited. Cotton of excellent quality can be produced in Barbuda and steps to develop the industry on a large scale as a peasants' crop are now well underway and bid fair to be successful.

## TOMATOES

Tomato growing for export was a new activity and much elementary work by way of educating the peasants in the methods of growing and harvesting fruit for export had to be done. The peasants proved very apt pupils and in a short time the interest in tomato growing spread at such an amazing rate that fair quantities of exportable tomatoes were produced. Shipments to Canada were organised in late December of 1936.

The entire supply of seed for planting was given free of charge by the Government and from the month of October tomato nurseries were maintained and seeds distributed to certain peasants living in remote parts of the island and away from the district nurseries.

The Marglobe type was exclusively grown and on the whole produced fruit of excellent quality true to type and of heavy production.

The season proved very wet. Excessive moisture caused considerable loss of fruit. The Stem End Rot and the Bubbly Fruit Rot developed during the wet periods and were limiting factors to production.

The number of peasants shipping tomatoes in the Government Marketing Depot amounted to 348. Only exportable tomatoes were received and as an object lesson to growers the rejection of all fruit was done in the presence of the grower. It may be said that this system had the advantage in educating growers in the class of fruit required for export. During the season 39,627 lbs. tomatoes were exported in 2,060 crates. The period of export was from late December to late May. The early shipments had to face the usual competition from Bahamas, while the quality of the first shipments were somewhat impaired by disease developing in fruit after packing. In spite of these drawbacks, however, the results were quite satisfactory. From the 39,627 lbs. exported the net total received after deducting all local shipping and packing expenses amounted to £180. 14. 9. The net average price per pound was therefore 2.1 cents, which can not be considered unsatisfactory.

The following extract of a report on the Antigua tomatoes from Canadian Brokers may be of interest.

"We are sorry that the early shipments of tomatoes showed such poor returns due to the very heavy waste. However, we are pleased that the quality is gradually improving and you will note the last shipments show better results than the earlier ones."

The following details concerning the Tomato crop of 1937 may be of interest:—

TOMATO RETURNS.

| Date of Shipment. | Weight shipped. | Nett return to grower per lb. |
|---|---|---|
| Nomember 30th, 1936 .. .. | 233 lbs. | 1.3 cents |
| December 14th .. .. | 586 | 1.2 |
| December 28th .. .. | 1,928 | 1.3 |
| January 10th, 1937 .. .. | 3,840 | 1.4 |
| January 25th .. .. .. | 4,546 | .8 |
| February 8th .. .. .. | 4,505 | 1.1 |
| February 22nd .. .. | 4,439 | 2.0 |
| March 8th .. .. .. | 4,964 | 2.3 |
| March 22nd .. .. .. | 5,886 | 2.7 |
| April 5th .. .. .. | 3,432 | 4.6 |
| April 19th .. .. .. | 1,730 | 5.3 |
| May 3rd .. .. .. | 1,981 | 5.1 |
| May 17th .. .. .. | 1,210 | 2.7 |
| May 31st .. .. .. | 347 | 2.4 |

## OTHER CROPS.

The following other crops were grown and exported under the auspices of the Government Marketing Depot with the following results.

## LIMES.

Considerable areas of lime cultivation exist in Antigua, but lack of marketing facilities have retarded progress.

There is one lime distillery plant which handles the crop of an estate but no attempt to market peasants' limes in any form or shape has yet been developed.

A start was, however, made to market peasants' green limes in Canada and Bermuda. These markets, although very limited, are welcomed and the need for a Central Lime Oil Distillery plant is very much in evidence.

The following are the results of the efforts made to market green limes.

| | | | |
|---|---|---|---|
| To Canada | 165 Crates shipped and netted | 3/4 | per crate to the grower. |
| To Bermuda | 374 Crates shipped and netted | 2/3½ | per crate to the grower. |
| Total | 539 Crates. — Average price | 2/8 | per crate to the grower. |

## PUMPKINS.

A market was found in Bermuda for Pumpkins of a certain size and colour and shipments were organised. Antigua produces an excellent dry pumpkin of long keeping qualities. The market calls for a small to medium pumpkin from 4 to 8 lbs. in weight. The colour should be green to dark green with white or yellow strips or spots.

During the season 22,720 lbs. were exported to Bermuda and the average price realized was 1.8 cents per lb.

Canada would probably take our pumpkins but high freight and packing charges are factors to be overcome. A small sample crate of 35 lbs. nett was shipped to Canada and the price realized was 37 cents or approximately 1 cent per lb. The following report was received from Brokers:—

"The sample crate of Pumpkins duly arrived and as these are not well known on the market, we were only able to sell it for $1.00

"On investigating the possibilities of regular shipments, we did not receive very much enthusiasm although probably we can use a few barrels per boat at around 2c. per lb. delivered. We are afraid this price would not be attractive but if you wish to ship two or three barrels we would try and obtain at least 2½c. a pound for you."

## PINEAPPLES.

Every effort to resuscitate pineapple growing and build up an export trade is being made by the Department.

It would be misleading, however, to build up too optimistic a view of the extent to which this industry can be developed.

The Antigua pineapple (a Ripley variety) is the variety that the Canadian consumer will buy freely as they need no sugar when they are being prepared for the table. The proper time to get pineapples on the Canadian market is in early May and June. Unfortunately the Antigua crop does not come into full maturity before the end of June and up to late August so that our crop can not be placed on the Canadian market before July. This constitutes a real drawback to development. Antigua pineapples come in competition with Cubans and Puerto Ricans, when at the peak of the shipments the price dropped to $2.00 per crate gross of 30 fruit, which is really not remunerative.

Markets were tried in the following places, Barbados, Trinidad, Canada and Bermuda, with the following results:—

*Barbados*—2 Crates—60 fruit at 3½c. net per fruit.
—1 Barrel—80 fruit at 7c. net per fruit.
*Trinidad*—2 Crates—60 fruit at 3½c. net per fruit.
*Bermuda*—29 Crates—870 fruit at 7c. net per fruit.
*Canada*—79 Crates—2,370 fruit at 3c. net per fruit.
*U.K.* (f.o.b. sales)—24 Crates—360 fruit at 8c. net per fruit.

## CARROTS AND TURNIPS.

87 Bushels Crates of Carrots and Turnips were exported to Barbados, Trinidad and Canada. Prices ranged from 2/5½ to 3/11½ per crate of 50 lbs.

Antigua can grow excellent carrots for export, but the crop is a low priced one and growers are not satisfied with the export prices.

Small shipments of Coconuts, Cabbages, Peppers and Onions were made and further trials on a larger scale will be made next season.

### SUMMARY OF EXPORTS, 1937.

| | | | |
|---|---|---|---|
| Tomatoes | 39,627 lbs | @ 2.1c | per lb. net. |
| Pumpkins | 22,720 lbs | @ 1.8c | per lb. net. |
| Pineapples | 3,870 fruit | @ 4½c | per fruit net |
| Green Limes | 539 crates | @ 54c | per crate net. |
| Carrots & Turnips | 4,350 lbs | @ 2c | per lb. net. |
| Onions | 2,100 lbs | @ 2½c | per lb. net. |
| Sweet Peppers | 5 crates | @ $1.00 | per crate net. |
| Coconuts | 500 selects | @ 1¼c | per nut net. |

## AGRICULTURAL INSTRUCTION

An important feature of the duties of the Peasant Agricultural Department was concerned in educating peasants of the measures adopted by the Government for their economic and social improvement and to inculcate in them a spirit of responsibility of their obligations to ensure the success of the scheme.

The aims of the new office to create a sturdy and reliable peasantry was brought home to the people. It was emphasized that while the Government in its initial stages of the scheme would be very paternal to the people yet the ultimate aim behind these measures of relief was intended to develop a self-reliant small-holder class, capable of maintaining and improving its social and economic standing in the community.

Apart from brief talks given to growers in their holdings, a large number of meetings were held at the various centres, when the officers of the Department gave lectures on various agricultural topics. These meetings were well attended and much interest was manifested. The chief centres where meetings were held were:—Liberta, Piccadilly, Bethesda, Freetown, Seatons, Sweets, Johnson Point and the Island of Barbuda.

## THE 5 YEAR SCHEME FOR PEASANT DEVELOPMENT.

During the year the approval of the scheme was received from the Colonial Office. £12,085 was granted as a free gift from the Colonial Development Fund for the development of peasant agriculture in Antigua and Barbuda.

During the latter part of the year, the work of organising the scheme was started.

The scheme will be found to fall under five heads, covering, it may be said, every aspect of agricultural enterprise on the part of the small-holder:—

A. The supervision and development of sugar cane production by peasants in the areas tapped by the new extensions of the light railway systems which have been made possible by assistance provided by the Colonial Development Fund.

B. The supervision and development of certain land settlement schemes in the southern parts of the Island, especially in the Piccadilly area, for which it has not hitherto been possible to provide the same measure of attention as the more developed schemes at Greencastle, Matthews and Jonas.

C. The encouragement of the cultivation and supervision of the marketing of Sea Island Cotton in the drier areas of the Island and in Barbuda.

D. The encouragement of cultivation and supervision of the marketing of fruit and vegetables in suitable areas.

E. Improvement of the live stock of the peasants.

C. A. GOMEZ,
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March 30th, 1938.

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